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IN TIBET
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FOR CLIMBERS, TRAVELLERS, AND OTHERS.

IN THE ICE-WORLD OF HIMALAYA. By FANNY BULLOCK WORKMAN and WILLIAM HUNTER WORKMAN. Illustrated from Photographs, and with Four large Maps. Demy 8vo, cloth gilt, 16s.

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IN TIBET AND CHINESE TURKESTAN

BEING THE RECORD OF THREE YEARS' EXPLORATION

BY

CAPTAIN H. H. P. DEASY

LATE 16TH QUEEN'S LANCERS,
GOLD MEDALIST OF THE
ROYAL GEOGRAPHICAL SOCIETY

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as

WITH APPENDICES, MAPS,
AND ILLUSTRATIONS

Crossing the frozen Yarkand River

COLONIAL EDITION.
LONDON: T. FISHER UNWIN

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PREFACE

IN presenting to the public a record of my journeys and explorations in Tibet and Chinese Turkestan, I wish to express my heartfelt thanks to Colonel St. G. C. Gore, R.E., Surveyor-General of India, and to the Officers and Officials of the Trigonometrical Branch at Dehra Dun for the very great assistance given me by them, both privately and officially.

My thanks are also due to my friend, Arnold Pike, for his genial companionship, his very valuable services in numerous ways and for his ready acquiescence in allowing me to reproduce some of his photographs.

Amongst the many others to whom I owe a debt of gratitude are the Council of the Royal Geographical Society; Major G. Chenevix Trench, formerly British Joint Commissioner in Ladak; Captain A. H. MacMahon, C.I.E., C.S.I., formerly Political Agent at Gilgit; G. Macartney, Esq., C.I.E., Special Assistant for Chinese Affairs to the Resident in Kashmir; Major W. R. Yeilding, C.I.E., D.S.O.; the Astronomer Royal, Mr. W. H. M. Christie, C.B.; Mr. E. G. Baker, of the British Museum, for kindly preparing the Botanical Appendix;

and Mr. G. E. H. Barrett-Hamilton, F.Z.S., for allowing me to publish his Paper on my collection of Mammals.

Of a more special character is my gratitude towards the many friends who showed me kindness during two long weary months spent in the Ripon Hospital at Simla.

I am indebted to the Royal Geographical Society for allowing me to reproduce the map which is a reduction from all the sheets of my maps published by the Survey of India.

Throughout this work I have been actuated by one main idea, and that is to record the more interesting features of my journeys without in any way exaggerating.

H. H. P. DEASY.

CAVALRY CLUB, PICCADILLY.
March, 1901.

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IN TIBET AND CHINESE TURKESTAN

CHAPTER I

Desire to explore—Tibet a good field—Difficulties to be encountered—Object of expedition—Preparations in Srinagar—Goodbye to Trench—Crossing the Zoji La—Matayan—Journey to Leh—Arranging the caravan—Departure from Leh—Visit to Himis Monastery—Crossing the Chang La—Hired transport—Fobrang—Final preparations—The Marsemik La Chang Chenmo—Crossing the frontier—Entering unknown land—Without guides—Commencement of triangulation—Horpa or Gurmen Cho—Magnificent snow mountains—Untrained assistants—Our first yak—Yeshil Kul—No water—"Fever Camp."

I HAD long entertained the desire to travel in some unknown country, and in the spring of 1896, when circumstances were favourable, the wish was transformed into a settled purpose. The vast extent of the territory marked "unexplored" on the map of Tibet, then recently published, at once attracted me, and it was to this inhospitable and almost inaccessible land that I resolved to proceed. My efforts had already been devoted to the study of the appliances which are indispensable to the explorer. Remembering Sir Richard Burton's warning that travel in unknown lands is mere waste of time unless the traveller has suitable instruments and skill to

use them, I had sought to acquire the requisite knowledge. In 1893, when home on sick leave from India, I had begun the study of astronomy and surveying under the guidance of Mr. Coles of the Royal Geographical Society. On several voyages to and from India I was able, by the kindness of many of the P. and O. Company's officers, to practise regularly the taking of sights at sea. At the Trigonometrical Branch of the Survey of India, Dehra Dun, I devoted some time to these studies under Colonel St. G. C. Gore, R.E., to whom I am deeply indebted for valuable instruction and assistance.

To determine the probable error in longitude arrived at from observations of moon culminating stars, a method of ascertaining longitude not the best, but the next best, irrespective of all but local time, I took two series of observations with a six-inch transit theodolite, one series by the kind permission of the Astronomer Royal at the Royal Observatory, Greenwich, and the second at Lucknow, where I was quartered for some time. These observations, but especially those taken at Greenwich, proved of very great value, and I was able to judge with close approximation what degree of accuracy might be expected. The result of five nights' work at Greenwich gave an error of less than one second, and the error at Lucknow was about five seconds of time.

Besides learning astronomy and surveying, I devoted much time to the study both of the theory and the practice of medicine and surgery, for, to my regret, I knew very little about them.

The south-eastern part of the great Central Asian plateau, known to Ladakis and Tibetans as Chang Tang, and to Europeans as Tibet, presents an enormous field for exploration and surveying, but no portion of Asia is more difficult to penetrate, and, owing to the intense dislike of the natives to strangers, the difficulty of

entering is exceeded by that of remaining, even for a short time, within the country.

To show the conditions under which, to be successful, a lengthy journey into the little known land of the Lamas must be prosecuted, it will not be superfluous to mention some of the difficulties which must be overcome. Considered separately, the most serious are those of obtaining transport, supplies, guides, and trustworthy men, but these and many others are included in the fact that the journey lies through an uninhabited country.

Transport must be purchased, as no natives of any adjoining country will provide animals for more than a few marches across the frontier. The best beasts of burden for Tibet are undoubtedly the sheep of the country or of Ladak. If in good condition at starting, and in charge of a man who knows his business, they will carry loads of about 22 lbs. for a long time, but they must not be hustled, nor driven more than twelve or fourteen miles daily, and they should have at least one day's rest every week. Sheep do not require either corn or shoes, which must be carried for all other animals, of which the small, sturdy mule from Chang Tang is the best, donkeys ranking next, and the hardy, small, thick-set pony of Tibet, Ladak, Kashmir, or Turkestan, a good third. Suitable animals are not always easily purchased in Kashmir, while in Chinese Turkestan it is most difficult and tedious to obtain them, even at fancy prices.

An equally important matter is the provisioning of the caravan. In the present state of affairs it is absolutely necessary to keep to the uninhabited country, and, if the journey is to be a long one, the supplies must include not only food for the men for some months, but grain for the animals as well. Owing to the great elevation, only those who are accustomed to hard work in rarefied air should be engaged as caravan men. For caravan work the

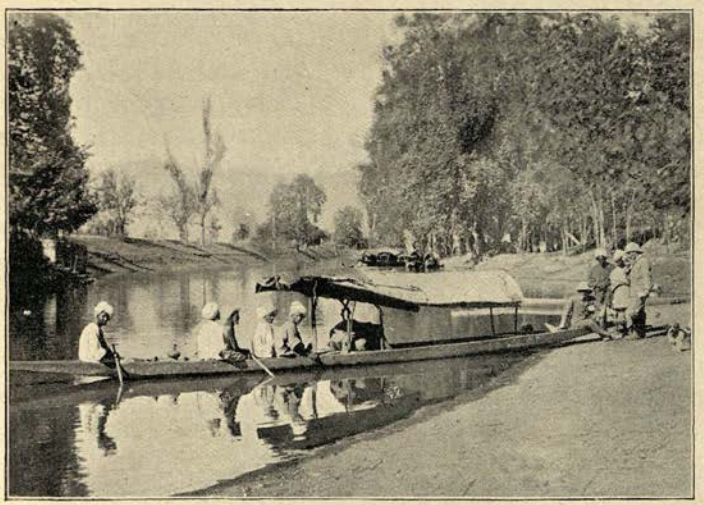
Argûns of Ladak are most suitable, being immeasurably superior to the natives of Turkestan. The latter, being unused to the conditions of life at great altitudes, are, in general, easily exhausted. Excellent as Argûns are for this service under very trying conditions, nearly all of them are utterly devoid of courage of the combative sort. In the midst of difficulties arising from the nature of the ground they do their work most admirably, undergoing hardship and exposure without a murmur, but when trouble is caused by human enemies they are simply helpless. Ninety-nine out of a hundred Argûns if attacked will neither fight nor make the slightest show of resistance.

Doubtless many inhabitants of the country near the frontier are intimately acquainted with the principal routes from their neighbourhood into Tibet, but so great is the dread of the Pombos, or headmen of Tibet, who with their assistants threaten vengeance against all who guide strangers into the Chang, and even against the relations of such guides, that every one denies all knowledge of the country.

A journey without guides through an unknown country represented on the map merely by a blank space, becomes more difficult and trying when the region is without inhabitants. There the traveller is at the mercy of accidents. Provisions may fail, water may be unattainable, animals may die or be lost, disease may invade the caravan, and any one of these calamities might be fatal to the expedition. On the other hand, if inhabitants were encountered at an early stage of our journey into Tibet, our advance would certainly be stopped. A route had therefore to be chosen where none would be found. The general object of my first expedition was to explore and survey, as accurately as time and circumstances would permit, an extent of country on either side of a route which was to be distant from the routes of other

travellers. The only way by which I could confidently rely upon entering Tibet without opposition was *viâ* Ladak and the Lanak Pass.

At Srinagar, Pike and I were the guests of the hospitable Captain G. Chenevix-Trench, and our time was fully occupied with the necessary preparations. Here we were provided with travelling outfit for ourselves, for the sub-surveyor, and for two orderlies from the 1st Battalion of



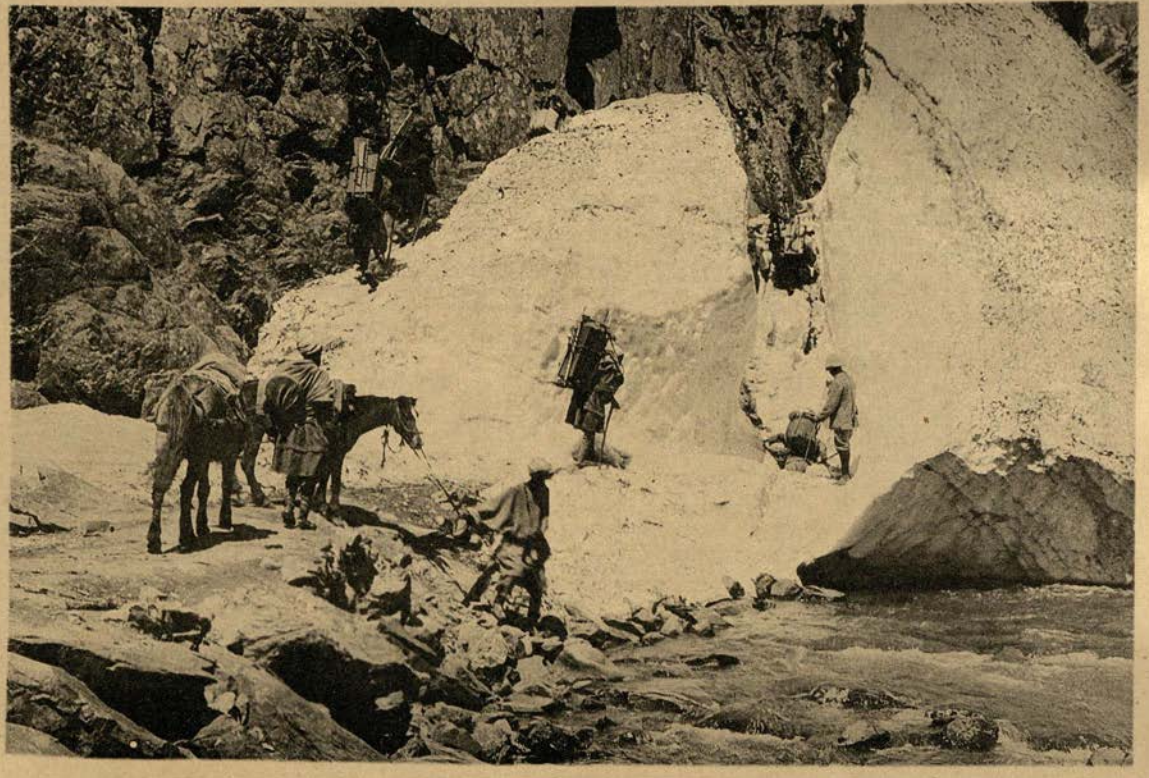
THE START FROM SRINAGAR.

the 2nd Gurkha regiment. The Zoji La, a much-dreaded pass where the loads would have to be carried by the coolies, was not far ahead, and, in packing the Yak dans and making up the bundles, it was necessary to limit their weight. The maximum which a coolie would attempt to carry over the pass was 50 lbs., but we had a Berthon duplex collapsible boat, and also loads of ammunition, which could not be brought within this regulation maxi-

mum. For the transport of these we therefore provided carriers in numbers proportioned to the weight. After many busy days these and sundry other matters were duly arranged, and, having said goodbye to Trench, whose assistance I shall always gratefully remember, we were paddled across the pretty Dal Lake to its western shore, where our march began.

We soon left behind us the picturesque Scind Valley and approached the Zoji La. Although the pass is only 11,500 feet high, it is by no means easy to cross, especially in spring and early summer, when destructive avalanches are not infrequent. At Baltal we entered the large rest-house which had recently been erected for travellers, and which contained ample accommodation for coolies. It was our purpose to attempt the pass during the night, for then the snow would be comparatively firm. To be ready to set out in a few hours, I lay down on a bundle of pine branches which served to keep me off the wet and muddy floor. I was eagerly alert and watchful for the light of the moon which was to show us our way. The coolies, over one hundred in number, had agreed to the nocturnal march, and as soon as the light was sufficient I called them to set out. Nothing would now induce them to move, the excuse being that it was forbidden by one of the great gods of India, "Dustour" (custom), to start before four o'clock in the morning.

About that hour they began to move, though the weather looked very bad, and there was but little moonlight. The long march, entirely through deep, soft snow, was trying, and it was not till late in the evening that we were able to refresh ourselves with tea at Matayan. There a small rest-house had been built, containing only one room, and that large enough to hold only four beds. The place was cheerless and bare, and could afford us nothing but a little firewood.



A NASTY PART OF THE TRACK.

The journey to Leh was marked by one unpleasant event, a slight attack of sunstroke from which Pike suffered owing to insufficient protection from the sun, and by troublesome mules, many of which showed great dislike of their loads.

The mules and ponies, the former in excellent condition, had met us a few marches from Leh, and I at once

COOLIES RESTING ON THE SNOW.

set myself against the absurd and cruel habit in vogue in Turkestan, and seen also in Ladak, of tying up animals without food or water for some hours after a march, and of watering soon after feeding. On this subject Ramzan, who, I believe, had been a tailor, but had now blossomed out into a bashi, or head of a caravan, received strict orders, which he repeated to me, and, apparently, clearly understood, but the moment my back was turned and the

nosebags taken off, he commenced watering the animals, a proceeding which provoked me to plain, rather than polite words.

Thanks to the good services of Bishan Dass, the Wazir of Ladak, we were enabled to get, without trouble, the large quantity of supplies which we required. This official, as indeed all of the Kashmir State, with the exception of the Governor of Srinagar, rendered us in

VILLAGE COURT AT DRAS.

many ways invaluable assistance, for which I am much indebted.

While at Leh all the loads had to be rearranged and weighed, and their contents carefully catalogued; flour, rice, bread, ghee, barley, suttoo (theoretically, ground parched barley, but practically, often adulterated with sand, &c., indigestible even to Ladakis), and many sets of horse shoes and nails had to be bought, packed up, weighed, sealed, and catalogued.

Here also we had to engage some fresh caravan men. We could not give precise information as to our destination and, consequently, some who had formerly been willing to accompany us, now said that their health, or the health of their relations required them to remain at home. In Ladak a traveller collecting a large caravan is supposed to have in view either a journey to Yarkand, or an attempt to reach Lhasa. A denial of the former purpose is equiva-

MY CARAVAN LEAVING LEH.

lent to an admission of the latter, while no statement respecting any third course seems worth considering. Men who have been tempted by the prospect of good pay, seldom refuse to run the risk of involving themselves or their friends in pains and penalties for the sake of a stranger. Those also of our men who were less in dread of the Tibetans, naturally wished to know where we were going. As we ourselves did not know, we could not tell them, and, to compensate for the vagueness of our

purpose, our promises of pay and of backsheesh had to be clear and large.

All the ponies purchased for us prior to our arrival in Leh were in very poor condition, while some of them were so old as to be of but little value. The mules had been very well looked after during the winter, and were in excellent condition. So fresh were they that for the

"DAN LENO," MY FIRST SUB-SURVEYOR.

first few marches, even when fully loaded, it was absolutely necessary for each one to be led.

After a couple of postponements, due to convenient "burrah dins," or holy days (literally, big days), no doubt arranged for the occasion, and to excuses from nearly all the men, the caravan at length, on May 25th, set out from Leh amidst a scene of great excitement.

The cavalcade, which was of imposing extent, was in charge of the sub-surveyor, S—— D——, whom Pike

familiarly called "Dan Leno," a name to which, even when abbreviated to "Leno," he readily answered.

Unfortunately, the best of the two Ghurka orderlies was suffering from remittent fever. To take him further was out of the question, and though the poor fellow pleaded hard and burst into tears of disappointment, he had to be left at Leh in charge of the doctor, who was enjoined to send him back to his regiment as soon as he was fit to travel.

The Chang La, a very high pass on the direct route between Leh and the Pangkong Lake, being still impracticable for animals, a large part of the caravan had to make a long *détour*, and Pike and I had time to visit the celebrated Himis Monastery on the opposite side of the Indus.

The Changzote, or head lama, honoured us by coming to meet us a few miles from the establishment, where tea, chang, &c., were offered us.

Tea is no doubt an excellent social beverage, and very refreshing, but the concoction which was presented under the guise of tea was unworthy of the name. It was a preparation of twigs and dirt with a few tea-leaves thrown in; the mixture is first well boiled, then improved by the addition of ghee, salt, and milk, and finally churned. At the risk of giving offence, I disclaimed the love of tea and expressed a decided preference for chang or even water. Chang is a drink made from barley, and is said to be an intoxicant, but, though I have often drunk it, I never could get any "forrarder" from it.

I shall make no attempt to describe the Monastery, which abler pens than mine have already made familiar to readers of books of travel.

Having recrossed the Indus we spent the night at Zingral in a wretched shelter, called a serai, about 1,400 feet below the top of the Chang La. Up to

this point we had been able to bring riding ponies, but had now to continue the ascent on foot. With the prospect of a long and tiring march across the pass, we set out at about two o'clock in the morning from the insect-infested room, which evidently had often served as

THE CHANGZOTE OF THE HIMIS MONASTERY.

a stable, and in about two hours we reached the summit. Fortunately the morning was not very dark, and although there was a moderate fall of snow from about 3 a.m. we were generally able to keep to the track made by the coolies, eventually reaching the village of Durguk about eleven in the forenoon.

LOADING SHEEP AT FOBRANG.

The rest-houses in these parts are a great convenience to travellers, but might easily be improved. Doubtless they are liable to abuse at times, but there are permanent causes of discomfort which might be removed. For the insect plague there is probably no remedy, but, on a hill-slope, the construction of a dry floor and a chimney with sufficient draught to carry up the smoke seems not impracticable. To the natives the warmth of the smoke from the green fuel on the hearth compensates for its pungency, but my eyes never became habituated to the discomfort.

At Fobrang, a tiny village of about half a dozen houses, at an altitude of about 14,800 feet, probably the highest cultivated place in the world, we halted for some days to await the arrival of the caravan. Here we obtained the last instalment of the supplies which our good friend Bishan Dass had collected for us; we also purchased sheep for transport purposes, and arranged for carriers to go on ahead with the sheep by easy stages as far as the Lanak La, on the west side of which they would find grass.

When our preparations were complete the caravan, all told, consisted of Pike and myself, Leno (the sub-surveyor), Rassoula (cook), one Ghurka orderly, two sikhs, Dass (cook for the Hindus), Ramzan (caravan bashi), ten caravan men, and one shepherd, besides the carriers who were sent on in front with the sheep. The transport animals comprised twenty-seven mules, thirty-five ponies, and fifty sheep, but there were among us also three riding ponies and a donkey, a very fine one, which had been given to Rassoula. The mules were said to be Chinese, but their native land was doubtful; the ponies were from Kargil, Zanskar, and Ladak; two of the riding ponies were from Badakshan, the other and the donkey from Yarkand. Our baggage contained personal effects,

ammunition, tents, medicines, instruments, cooking utensils, money, and various articles which, if necessary, might be given as presents. But food supplies formed the most burdensome part of our equipment. These consisted chiefly of grain, bread, and tinned meats. We had 8,650 lbs. of partially crushed barley, 1,480 lbs. of attah, 1,200 lbs. of Kusta or Ladak bread, which keeps well for months, 620 lbs. of rice, and 1,810 lbs. of Suttoo. The tinned meats, instruments, money, &c., were packed in yak dans, while Suttoo, attah, rice, and Kusta were put into sacks made of Baxter Brothers' water-proof canvas. Every yak dan, box, sack, and package was weighed and numbered, and the weight recorded in the catalogue. Yak dans were padlocked, one key opening all; sacks were sealed with leaden seals so that no one could open them in our absence without detection. The total weight of baggage and stores was about 17,000 lbs., or more than six and a half tons, an appalling amount to be loaded and unloaded daily, especially as the Ladaki caravan men are undoubtedly very bad packers. But we carried nothing which could be dispensed with, and as a large portion of the food supplies was for the animals the weight would rapidly diminish.

We had a choice of two routes from Fobrang to Lanak La, one by the An La, Niagzu, and Kieuns La, the other by the Marsemik La, Pamzal, and Kyam. The former seemed preferable for several reasons: it was considered to be the easier; it was not, as the Marsemik was reported to be, blocked with snow; and, lastly, part of this route, in particular the An La, was not mapped. But just as we were about to start, we learned that for some distance in this direction water was very scarce; we knew also that two officers of the Rifle Brigade had recently crossed the Marsemik, and, on the whole, it seemed the more prudent course to follow the latter route. We en-

CARAVAN REACHING RIMDI.

deavoured to obtain yaks to relieve our own animals in crossing the snow-covered pass, but, being unsuccessful, had to put all the baggage on the mules and ponies.

Having completed our arrangements we set out on June 9th from Fobrang, the last village we should see for nearly five months. The ascent of the Marsemik was accomplished with ease, for the few patches of frozen snow which had to be crossed presented no obstacle, and we hoped to be able the same day to reach Rimdi, where we should find a resting place. But the descent on the eastern slope was very difficult. The snow was deep and soft, almost impassable for our heavy-laden animals. At first the leaders went on without mishap, but the mules and ponies behind soon began to stray from the track and to flounder about most distressingly. In a short time they were struggling to free themselves from their encumbrances; the baggage was scattered about in the snow in all directions, and scarcely an animal was carrying its load. The Argûns worked hard and did their best, but it was evident that all thoughts of pushing on the caravan to Rimdi that day must be abandoned. This was my first experience of the atmospheric conditions at a great altitude, and I was physically unable to render much assistance. I suffered from a severe headache, which continued till we reached a considerably lower level, but the caravan men seemed to suffer no inconvenience whatever from the rarefaction of the air.

Tents, bedding, and some cooking utensils having been collected and placed on the backs of the animals which seemed least exhausted, Pike and I, accompanied by Leno and the servants, were able to continue the descent. The soft snow reached to the girths of the mules, but we pushed on and, late in the afternoon, found the spot called Rimdi, a fairly level piece of stony ground with a scanty supply of grass. For cooking we could find no

fuel except dung, but this seemed to provide the means of luxury when we contrasted our position with that of the greater portion of the caravan, compelled to spend the night on the cold, bare, and windswept slope not far from the top of the pass.

As soon as the caravan could be collected we resumed our march to the Lanak La. On the west side of the pass we halted for a day to rest the sheep, and allow the animals to have a good feed after the very scanty grazing they had found in Chang Chenmo.

In the night between the 16th and 17th of June the thermometer fell to 8° Fahr. at an altitude of 17,450 feet, or only 500 feet lower than the Lanak La, which was quite free from snow when we crossed it on the 18th.

This pass was an easy one, but as to the country beyond I now felt some anxiety. We knew that Bower, Dalgleish, Carey and De Rhins, and possibly one or two other Europeans, had been over the ground, but the only maps we possessed were on too small a scale to be of much assistance. Beyond the pass there was no track. Our predecessors had come and gone, but the country bore no evidence that any traveller had ever passed that way. Pike had marvellous skill in finding the track of animals, but he could not discover a vestige of the visit of any human being.

After leaving Camp 2, Shum, the men who came with the hired transport from Fobrang professed ignorance of the route, so that Pike and I had to guide the caravan through an unknown land. On the second day after crossing the frontier at the Lanak La we passed into a long, broad, and well-watered valley, to the east of which, we knew, lay Horpa or Gurmen Cho, but beyond this we had no definite knowledge of the country.

My plan was to visit the north side of Horpa or Gurmen Cho, Captain Bower having gone by the opposite

side, then to travel in an easterly direction, avoiding ground which had been visited by others, and to survey a tract of country on either side of the line of march.

In order to get a good value for the longitude of as many places as possible, I had commenced, at Camp 3, triangulation from a very prominent snow peak, designated Mangtza Lake No. 1 Peak, which had been fixed by the Great Trigonometrical Survey of India, and for the same purpose I now halted close to Horpa or Gurmen Cho.

The theory of determining longitude by triangulation is simple enough, but the practical work is not always easy. Owing to my want of previous training in the field, I found it difficult to identify peaks seen from various positions, and to remember the exact points that had been first observed in the peaks. The work was retarded also by the want of trained assistants.

For the accurate measurement of base lines and angles, it was necessary to erect pillars on prominent hill tops from which both ends of the base as well as the surrounding country and other hill stations could be seen. But the men appointed to erect them preferred the slopes of the hills to the summits, though the suitable point was often only a few hundred yards distant. Their preference could not in every case be detected before I reached the spot; consequently much labour had to be repeated, and the work was rendered unnecessarily complicated.

Ascending the small valley which runs into the north-east side of Horpa Cho, we crossed rising ground and entered a broad valley, bounded on the south by a range of high mountains with prominent snow peaks, most useful in surveying. On the north side of this valley were comparatively low mountains, none of them snow-capped, and through a gap, barely worthy of being desig-

nated a pass, we entered the depression in which lies the salt lake known as Yeshil Kul. Close to this gap were copious springs of good water and excellent grass, the place being evidently a favourite haunt of a few wild yak, one of which Pike bagged. While assisting to skin and cut up the carcase, not forgetting the marrow bones, which are far superior to those of any tame animal, I was much pressed by some of the caravan men to shoot another yak close by, apparently not in the least alarmed. We had already more meat than we could carry, and to prevent the wanton destruction of the animal by the Argûns I fired some shots close to him, and at length he galloped in safety over an adjacent ridge.

Not knowing that the Yeshil Kul was salt, and not finding any traces of other water in the neighbourhood, we camped as near to the south-east corner of the lake as the very soft, white, saline mud permitted. Being disappointed with the water we tried digging, but no success attended our efforts, and we had to fall back upon the limited supply in our water bottles. As luck would have it, I was unusually thirsty and fatigued that night. Next day I felt slack, and by the time we had settled to camp close to a few damp spots which betokened the presence of water I had not enough energy to take my share in the digging. Pike was very energetic and persevering, but, much as I tried to assist him, I was absolutely unfit for work. As soon as the tents were pitched I retired to mine, to make use of a clinical thermometer, knowing that if my temperature was above normal, I might look out for squalls, but if not, I might rest assured that I was not seriously unwell. As my temperature proved to be about 104°, I thought it wise to betake myself to my bed, having made a note in my journal that "Fever Camp" would be by no means an inappropriate name for this exposed, bleak, and cheerless spot.

CHAPTER II

Serious and light literature—Death of animals—Excursion of Leno—Bad water—Recovery—Weakness—Continuing the journey—Observing under difficulties—Thousands of antelopes—Reconnoitring—Sickness—Barren and waterless country—Economising candles—Another route decided upon—Lazy caravan men—Tame antelope—Death of Pike's pony—"Daily" stream—Fertile valley—Difficulty of finding a ford—Aru Cho—Death of my riding pony—Illness of Sanman—Animals straying—Caravan men suspected—Robbed by Chukpas.

AT the best, fever is disagreeable, and our bleak, exposed position close to a salt lake, in a country almost desert and many miles from any inhabitants, rendered it still more so. I had an ample stock of medicines, but only sufficient knowledge of their use to recognise that I knew very little about the healing art. Pike's medical skill was less than mine, so I had to doctor myself. For the first couple of days I was doubtful as to the malady that had attacked me, but, having carefully consulted that excellent medical work for laymen, "Moore's Family Medicine for India," I diagnosed my case, and having, as I believed, adopted the proper remedies, I was only too glad to do nothing except occasionally to seek relief from the languor of the fever in such light reading as our stores could supply, viz., "Whitaker's Almanac" and a sixpenny encyclopædia. In consequence of exposure to very bad weather some of

the caravan men became unwell too, and had to be doctored, and six ponies and Rassoula's fine donkey died before we were able to depart from "Fever Camp." During the enforced halt, a waste of very precious time, Leno went off on a short excursion for topographical work, which he was able to check a little by the few latitudes which he observed. It was very seldom that he had an opportunity of observing, as, unless my eyes were weak, I invariably did the astronomical work myself, although Leno was well trained and very accurate, and only found difficulty in aligning the theodolite correctly on to south stars, an operation commonly spoken of as "picking up" the stars. On the north side of Yeshil Kul, Leno noticed numerous pillars of stones and of horns of yak, antelope, and sheep built up with mud, all close together, also several circles about a couple of miles in diameter, formed by ditches about one foot deep and four broad, not far from the pillars. The Ladakis said that the Chungpas, or natives of the Chang, built them as places of worship.

For some days after I was free from fever I was too weak to travel. Illness, especially when accompanied by a rise of temperature, has a far greater effect on the human system at these great altitudes than at moderate heights, and, according to my experience, convalescence is slow and attended with an abnormally low temperature. How long this lasts is not recorded in my journal, as I ceased to ascertain my temperature a few days after it was not unusually high. There were numerous storms of rain, hail, and snow during the ten days of our stay near Yeshil Kul, a delay which caused very serious inroads into our supplies. It was with the very best spirits that we resumed our journey on the 18th of July, in an easterly direction along a fairly broad valley in which we found plenty of grass and some small lakes, at least one of

which was so impregnated with soda as to be very unpleasant to drink. On account of its disagreeable taste, the water of this lake is described on my map as "drinkable," but only very thirsty people will swallow much of it.

For travellers on land, observation of the stars is far more accurate and more convenient in every way than that of the sun, and I never took solar observations unless compelled to do so. But in the high winds of this region such nocturnal operations were trying for the temper. Partial protection could be arranged for the lantern by which Leno recorded for me in the open air, but no sufficient shelter could be devised for that which was employed to illuminate the wires of the theodolite. On several nights it was repeatedly blown out at the most important instants. At first I sheltered the flame by tying rags round a portion of the ventilator. These, however, excluded the wind too effectually, for, owing to the small amount of oxygen in the atmosphere at these altitudes, it is necessary to have ample space for the ingress and egress of the air. The re-lighting of the candle in such circumstances required patience, and involved the expenditure of many of the wax vestas which had been put up into special tins for us by Bryant and May. The candles, necessary for the work of computation, were not too plentiful; we knew not when our supply could be renewed, and we had no means of burning oil in the lanterns. I therefore practised economy by invariably putting out the lanterns the moment the instruments were packed away and the chronometer watches compared, and then going to bed in the dark.

Soon after leaving "Fever Camp," Pike and I had numerous discussions as to the best direction to take. Owing to an extensive snow-range in the line we wished

to follow, it was necessary to diverge either to the north or to the south of it. We agreed that if we shaped a southerly course we would probably find plenty of water, and that where there was water the all-important grass and boortza would not be far distant; whereas if we went into a somewhat higher latitude and comparatively open country with only low mountains, the chances were that water and grass would be very scarce. Although fully recognising the wisdom of adopting the former course, we eventually settled to venture on the latter, as it would lead us further away from Bower's route. Many people attribute to travellers in out-of-the-way countries a propensity to exaggerate. At the risk of incurring this imputation, I must refer to the enormous numbers of antelopes seen near Camps 19 and 20. For many miles in every direction except west, from Camp 19, in fact as far as the human eye aided by powerful binoculars could see, there were thousands of antelopes in large herds scattered about irregularly wherever there was plenty of grass. I must confess my inability to guess at the approximate numbers on the outskirts of the comparatively level ground called on my map "Antelope Plains," but Pike, who had had experience in sheep-farming in America, was of opinion that at least 15,000 were seen.

About this time two of the caravan men became too ill to march, and, as there was only one unladen animal, I had to mount Sonam on my riding pony and get along as best I could on foot. Though the marches were short, I was very tired before they were nearly finished, owing to weakness after fever, and I was exceedingly glad when it was time to halt and throw down my rifle, ammunition, field glasses, and water bottle. Nurdin, another Argûn, was also on the sick list with inflamed eyes. His right eye was so very bad at Camp 19 that I put a bandage over

it in order to make certain of his not using it, while the left eye was protected by goggles from the great glare which is nearly always experienced in Western Tibet, and probably in the remainder of the country as well. At least this was my plan, but he would not obey the strict orders he received; and, much to my annoyance, arrived at the next camp without the slightest protection for his eyes, the bandage and goggles having been discarded very soon after my back was turned. Finding that he would not carry out any orders I gave about his eyes, I was reluctantly obliged to cease my efforts to cure them, and leave him to his own devices. Of the two other invalids Sonam soon recovered sufficiently to be able to do without my pony, but unfortunately Sidik was found to be suffering from dropsy, which soon provided an excuse for his doing but little work, and later on nothing at all, except weeping whenever I spoke to him. For a long time he was an outcast from the society of the caravan men, who considered him lazy and feigning illness to avoid doing his share of the work.

Soon after getting abreast of the last large herd of antelopes we found ourselves in a barren country, and decided to pitch Camp 20 in a small nullah containing good water, while Pike went on ahead to reconnoitre, and the animals were sent back to graze. I, being still below par, remained in camp, but two caravan men—Ramzan, the bashi, and Islam—each on a mule, sallied forth in a direction somewhat different from that taken by Pike. They had received strict orders to keep a sharp look-out for him, as well as for the all-important grass and water; but passed him comparatively close in the open without seeing him. Fortunately he saw them, and brought them back. Needless to say after that proof of their defective vision they were never again sent out reconnoitring, and we ceased to place any reliance on reports

concerning the country by any member of the caravan except Leno.

Pike's reconnaissance revealed the unpleasant fact that for many miles there was not a trace of vegetation, and in all probability water would not be met with in the very open country east of Camp 20. Our animals were now in such wretched condition that we would most likely have lost many of them in trying to penetrate through this unknown, barren, and waterless country, so we reluctantly decided to go back one march and seek a feasible route in the direction we had previously thought of attempting. To people who have not travelled in Tibet or other countries where an equally clear atmosphere prevails, it is very hard to believe that, after a little experience, one can discern vegetation at a great distance. With the help of good field glasses it is possible, when on a commanding situation, to be almost certain of the presence or absence of vegetation, which in this part of Tibet takes only the form of grass or boortza, at a distance of about twenty miles, and, under very favourable conditions, nearly twenty-five miles.

At the foot of the range south of Camp 19 several very dark spots were noticed, which on closer examination proved to be the outlets of some evil-smelling gas, probably sulphuretted hydrogen. So powerful was the odour that in some instances our nasal organs were the first to inform us of the existence of these natural outlets, close to which the dead bodies of some insects, and I think one or two birds, bore testimony to the poisonous nature of the gas. Though the return march to Camp 19 was only about ten miles, Ramzan pleaded excess of work for the caravan men as an excuse for not sending out for an antelope which Utam Singh had shot near camp, but which he had not handled as he was a Hindu.

The caravan men were, in fact, so well fed without any

PIKE RECONNOITRING.

trouble to themselves that they had become too lazy to go even a short way to administer the *coup de grace* to any victim either of our rifles or of those of the Hindus.

Annoying as they were on this occasion, they were still more so on the next day when, instead of making an earlier start than usual, as ordered, the caravan did not set out till later than usual. Where our saddles or rifles were deposited at the end of the march, there they knew our tents would be pitched; and it was their business to prevent any of the mules or ponies from approaching, but now they showed not the slightest inclination to keep the animals off. Pike was so provoked that he addressed them in strong language, of which they complained to me; but I told them the wonder was that he had not beaten them.

The antelope in this neighbourhood were exceedingly tame, and from the very calm and leisurely way in which two large herds that I met between Camps 21 and 22 sauntered away after gazing long a couple of hundred yards from me, it was very evident that they were quite unfamiliar with human beings. As we were plentifully supplied with fresh meat for all hands, we refrained from slaughtering any of these unsuspicious beasts, who regarded the caravan close by with evident curiosity. Though grass was in several places very abundant, water was exceedingly scarce; but at one locality its presence was indicated from afar by the existence of a large disused sheep-pen. We surmised that men tending the sheep must have lived for some time close by, and they could not have done so unless there was water in the vicinity. Fortunately our surmise was correct, as a small spring of excellent water existed almost alongside the abandoned sheep-pen, affording a great contrast to the supply at our next camp, where the only water was that of a lake, so impregnated with soda, &c., as to be almost

undrinkable. The view from Camp 24 was most picturesque, the blue waters of the lake a few hundred feet from our tents, on an upper terrace which had at one epoch been submerged, formed a striking contrast to the fine range of high, snow-capped mountains on the southern side. No doubt in circumstances causing less anxiety the majestic nature of the landscape would have been properly appreciated, but then I could not exclude from my thoughts the facts that Pike was very unwell, that nearly all our animals were in very poor condition, that the men were not behaving well, and that we had no idea of when and where supplies and transport could be procured. On many of the hills near Camps 24 and 25 there are numerous lines, which looked like boundaries consisting of stones and small mounds, about one foot high, at regular intervals apart. The caravan men attributed these to Chukpas or robbers, who formerly had come to these parts to graze their flocks, and no doubt for professional purposes also if opportunities occurred, but who were now debarred from coming by order of the authorities of Lhasa. There may be some truth in this statement, but it is not very apparent how the Lhasa officials can hold sway over professional robbers in this distant part of Tibet, unless the latter contribute regularly to the state exchequer, or the pockets of its high officials, which are no doubt the same thing.

We were now in a country with a profusion of excellent grass, but water was not so plentiful. At one camp at the west end of the long valley leading into the lake north of and close to Aru Cho, the small stream by which we camped flowed only for a few hours daily, showing that the hot sun of a summer's day has only a very temporary effect on the glaciers at the western end of the snow range on the south side of the valley. Pike's riding pony, which had shown signs of weakness and

incapacity for further work, although by no means very emaciated, died during the night of the 29th of July amidst so much excellent grazing that poisonous grass was suspected, especially as a mule died at the same place. Much to my regret and, I may add, annoyance, nothing would induce my companion to share my riding pony which was at first continually offered to him, but always refused. We had decided to march along the northern side of this valley on account of the grass which was more plentiful there than on the opposite bank, where numerous rivulets and springs rendered the ground too soft for the progress of the caravan. Finding, however, that our general direction was more northerly than was thought advisable to follow, we resolved to cross to the south side. Our camp was close to a broad stream, the volume of which was small, but its soft and treacherous bottom proved a formidable obstacle, which we eventually negotiated successfully after much time had been spent in searching for a place sufficiently sound for the caravan to proceed with safety. Whilst some men were looking for a ford the majority went in search of thirty animals that had strayed so far during the night, that it was not until 5.30 p.m. that they were brought back to camp.

When time is of no importance, and transport and supplies do not cause any anxiety, a retrograde movement is of but little consequence; but when supplies are limited and the bearers of them decidedly thin, it is of the utmost importance to economise both time and labour. For a short time after striking Bower's route at the north of Aru Cho, we seriously considered the advisability of following it for a few marches before deviating from a previously trodden route, for it cannot be designated a track, as not a vestige of one was to be seen. We considered that in all probability we would be able to travel east by that route for at least some marches without

much bother, but, so great was the fascination of absolutely unknown country, that we elected to discard a practical certainty and trust to Providence in advancing further east over virgin ground. Even now I had not completely recovered from the effects of the illness at "Fever Camp," and it is to this weakness that I must ascribe the disinclination to measure a suitable base soon after completing the daily march. It was now the turn of my riding pony to give in. While being off-saddled at Camp 27 he fell down; the next morning he again temporarily collapsed; subsequently he was able to proceed for a few miles without any greater weight than a saddle on his back, but then he finally succumbed.

Striking contrasts in scenery are by no means uncommon in Tibet, as for instance, in the country around Aru Cho. On the western side of this lake, which we ascertained to be of a different size from that marked on the latest map of Tibet, there is a fine range of snow-clad mountains extending beyond the northern and southern shores of the lake, but on the eastern side there are only comparatively low mountains, none of which exceed 19,500 feet in altitude. Not far from the foot of the snow range in the south-west corner of Aru Cho there is an unusually large supply of wild rhubarb, which, though inferior to the cultivated kind, was not despised by us. The quality of the grass in this neighbourhood is infinitely superior to that of the coarse and very sharp kind, called "lungma" by Ladakis, previously encountered. Here a small, soft, fine grass, known to the Argûns as "peelee," largely preponderated, much to the benefit of our impoverished animals, who greatly appreciated this more nutritive food.

Once more inability to estimate distance correctly was brought home to us. When leaving Camp 29, we fully expected to pitch our next camp on the other side of a

very easy pass lying slightly east of south, but by the time we had crossed a large and very rapid river coming from the snow range which runs, roughly speaking, parallel to Aru Cho and on its western side, we were obliged to abandon the project and camp in a very small but well-sheltered valley, in which there was just sufficient water to supply the wants of men and animals. This lovely, clear water was in delightful contrast to the muddy torrent which had to be crossed before we reached the secluded site for camp. No riding pony being available either for Pike or myself, the only one left being allotted to Leno on account of his work, we had to get across on Shank's mare. I foolishly took off my boots and crossed barefooted, but very soon regretted having done so. Either on account of unusually tender feet or exceptionally sharp stones, my sensations in fording that brook cannot be truthfully described as the height of enjoyment. Sanman must have experienced still more discomfort as, when in mid-stream, he stumbled in such a manner as to be thoroughly immersed, an unpleasant *contretemps* of which he said nothing until he became unwell. Even then he would not report himself sick, and but for Leno, who informed me that Sanman was off his food, neither Pike nor I would have been the wiser. The annoyance of having another case of illness in our party was not diminished by the following dialogue:—

"Well, Sanman, what is the matter with you?"

"Oh, Sahib, I am shivering and very cold."

"What has happened to you?"

"I fell into the river to-day."

"Why did you not change your clothes as soon as camp was pitched?"

"I had too much work to do; the sahibs would not give me time to change."

"You son of an owl, what made you fall into the river?"

No reply.

"Why the . . . did you not tell the sahibs that your clothes were wet?"

No reply.

Finding his temperature 102·5° and further questioning useless, I administered a suitable drug and retired to my tent with the heartfelt regret that such a spoilt child was a member of the caravan. Neither Pike nor I had had any idea of Sanman's encounter with the bottom of the river, and, as his clothes bore no visible traces of the wetting, he had been detailed soon after camp was pitched to put some botanical specimens into the press, an operation which could easily have been postponed if he had only informed us of his accident. The next morning Sanman was somewhat better, but in a short time his temperature rose to nearly 104°, so we decided to halt for the day. One day's halt being as much as we considered advisable, our advance was resumed next day, although the sick man's temperature was 102° before we started and rose 2½° by the time the march was concluded. A second very precious day had to be spent in inactivity, but towards evening Sanman showed signs of improvement. Another annoying episode was the straying of many of the animals from the vicinity of Camp 31, involving the loss of another day whilst most of the men went in search of the missing steeds. By the next morning the eleven best mules and ponies were still missing, a condition of things which we erroneously ascribed to the desire of the caravan men to retard our advance. Having left Ramzan and two men to look for the mules, we went on with as much baggage as could be carried, and camped on the other side of a low pass to the south of the lake close to Camp 31, hoping that this

plan would act as an incentive to Ramzan and his two companions to recover the mules speedily. During this march we followed for most of the way a freshly used trail, but whether ponies or kyang had last used it we could not be certain, nor were the caravan men able to enlighten us owing to the common belief that the natives of this country could not afford the luxury of shoes for their ponies.

We were not left long in doubt of the presence of inhabitants, for, early in the morning of the second day after we had left Camp 31, Nurdin arrived with the news that the day after our departure a few Chukpas had suddenly visited camp, and having seized and bound the two men, had looted the baggage. Fortunately, photographic films, packed in hermetically sealed tins containing half a gross each, were not considered of much value, matches, rice, and suttoo being more prized by the Chukpas. I have but little doubt that the guards left behind were far too frightened when the robbers appeared to offer any resistance, for only two visitors were seen and no mention was made of any attempt on the part of Ramzan or Nurdin to protect the baggage. As there was still no news of the eleven mules, we now very naturally considered that the Chukpas were in possession of them, and we promptly held a council of war to settle the best plan of operations to regain the food stolen from camp as well as the much prized and indispensable beasts of burden. As the missing animals were undoubtedly the best we had and free from sores, it was considered far more likely that they had been stolen than that they had strayed, notwithstanding their well-known propensity to stray even when in the midst of good grazing.

CHAPTER III

Council of War—Plan of operations—Skill and pluck of Pike—Changfûnchuk—Chukpas completely surprised—Anxiety about Pike—Searching for missing Animals—Burning surplus Baggage—Our Situation—Serious Outlook—"Caching" Stores—Making Clothes out of Tents—Illness of Pike—Anxiety about Water—Waterless Camp—Meeting with Nomads—They refuse to help us—Shown the wrong direction—Lost in the Desert

AS there was evidently an enemy hanging about in this neighbourhood, we held a council to concert measures for the recovery of supplies and transport. Though the general disposition of our company was not warlike, we came unanimously to the decision that the Chukpas must be found and compelled to make restitution. Pike and I had revolvers, and in the camp there were eight magazine carbines and a shot gun, but, besides ourselves, the only men capable of using these weapons were Leno, Sanman, Utam Singh (a Sikh), Changfûnchuk (an Argûn), and Dass (the Hindu cook), who had courage enough for the discharge of the shot gun but was incapable of using it with the necessary deliberation. So far as fighting was concerned, it mattered little that a considerable number of our men were absent, looking for the lost mules. Pike undertook the search for the marauders and chose as his companions Utam Singh, a man who could be relied on, and Changfûnchuk, who was a good shot. To my lot fell

the duty of remaining in camp for the defence of the property which still remained to us. At Camp 31 we had left some baggage, and, for the recovery of this, Leno, Ramzan, Sanman, and two caravan men with sixteen animals set out to accompany Pike as far as our old quarters. There was some ground for thinking that our movements were being watched by the Chukpas, who, not improbably, would make another inroad when our number was reduced. I did not wish any such intention on their part to be frustrated, and as the route between the two camps was not difficult, I instructed Leno not to return till after dark. The fighting strength remaining with me was thus reduced to Tara Singh (an old Sikh), and Dass, the Hindu cook. I next ordered look-out sentries to take up a position close to the camp, where the mules and ponies had been tied up, and sent out two men, one to keep the loose ponies from straying and to bring them back in the evening, the other to look after the sheep. These two men performed their work satisfactorily, but the sentry on duty at night could not keep awake. About half-past two in the morning I strolled round to see how things looked, and finding that the tied-up mules and ponies had been allowed to break loose, I had to despatch other men in search of the animals, and to undertake in person the work of sentry.

At daybreak I was relieved from my post by Tara Singh, whom I stationed on a neighbouring hill, whence he could see our camp and also the track to Camp 31. The old man's head, formerly black, had recently assumed its natural grey colour, being deprived of the dye which had supplied the lustre of youth. Having some hope of a visit from the Chukpas, I ordered all the men except the sentry, the shepherd, and the man with the loose ponies, to remain in their tents, but my hope was disappointed, and in the afternoon Tara Singh announced

that he saw Pike on the way back to camp. I hastened to meet him, and soon learned the result of his expedition. After ascertaining that the Chukpas had returned to Camp 31 and taken more of our supplies, he had pushed on rapidly, following their track, till he came in sight of their tents. Then he reconnoitred the position, and bivouacked for the night in a small nullah, where he would escape observation. Next morning, before daylight, he proceeded to pay a surprise visit to the Chukpas. On the way there was a stream to be forded, and Utam Singh without hesitation leapt with him into the ice-cold water and waded across. Changfûnchuk, however, was deliberate in his proceedings, waited on the bank, took off his boots, and then crossed at his leisure, so that, in spite of emphatic remonstrances by Pike, he secured a position well in the rear and free from immediate risk. By the time it was daylight they had reached the Chukpas camp and found that the inmates were on the move. The approach had been accomplished so stealthily that the Chukpas were quite unsuspicious, and when one of them stepped out of his tent and found Pike standing at only a couple of yards' distance, presenting a revolver at his head, he stared in surprise and then ran off. Here were found the rice, suttoo, and other provisions of which we had been robbed, but there was no sign of the lost mules. Other Chukpa tents were standing not far off, and it seemed expedient to retire at once with the recovered stores. Pike thought it prudent also to deprive the owner of the tent of arms and ammunition, and, as security for the mules which were not recovered, he seized two fine ponies. Some may be inclined to pity the poor nomads and to condemn Pike's proceedings as harsh, but it has to be considered that we were entirely dependent on our supplies for our life, and that beasts of burden were indispensable for transport. Successful robbery perpetrated on

men in these circumstances is little better than murder, and it was undoubtedly our duty to protect ourselves and those dependent on us.

We lingered in the neighbourhood for several days searching for the missing animals, but without success. They had evidently been taken far beyond our reach, and, as it was impossible to carry all our luggage without them, we had to consider what could be abandoned with

BURNING THE BERTHON BOAT.

least risk to ourselves. Of the mules still left, four died at this place, so that we had many pack-saddles and shools which were now clearly superfluous. The beautiful Berthon boat which, with much trouble, we had brought thus far was not indispensable; there were camp beds and chairs which, in the circumstances, we condemned as luxuries, and altogether a considerable reduction of the weight to be carried was found practicable. But,

though we were obliged to abandon these things, we were by no means disposed to make them over to the Chukpas, to whose malpractices the necessity for parting with them was largely due. We therefore regretfully consigned them to destruction. Whatever would burn we reduced to ashes, and of the costly pile soon nothing remained but unattached metal fittings and half-consumed leather.

During the twelve days we were compelled to remain at camp I carried out some geodetic measurements, and Leno, besides assisting me, executed much useful topographic work. To my regret, it was impossible during this period to obtain our longitude from observations of the moon and stars culminating near it. For a time the moon was too young, and, when it became sufficiently mature, clouds intervened, so that my preliminary computations and preparation for transit work were useless.

Though it was now the middle of August, snow fell frequently, and sometimes the ground was white till noon.

Our circumstances, on the whole, were depressing, and we were glad when any incident occurred tending to restore the cheerfulness of the company. There were antelopes in considerable numbers near the camp, and we easily obtained fresh meat. During most of the time the animals killed were perfectly lean, but at length a fat one was brought in, and at Pike's suggestion Rassoula set about the construction of an apple dumpling. Indian cooks love spices, while Ladaki cooks, under the influence of Turcoman taste, dispense onions with a liberal hand. The preparation set before us by Rassoula in the guise of apple dumpling consisted in fact of a mixture of onions and apples with a superabundance of spices; but hungry travellers are not over-critical, and we enjoyed the dump-

ling. Our usual drink was tea, but on one evening (and only one) we had recourse to hot toddy, the chief ingredient in which was rum.

We knew our latitude and longitude, and could point out on the map the spot occupied by our camp, but at that place the map was a blank, and none of the men had any knowledge of our whereabouts. The important question to be decided was whether we should retrace our steps, or move onwards through the unknown land. We carefully examined the remaining transport animals, and came to the conclusion that few or none of them would be able to carry loads as far as Fobrang. If we pushed on, what direction should we take, or where was there a practicable route? The country was mountainous and difficult, and even in the valleys water and grass were not always to be found. Our general purpose was to proceed eastwards, but after full consideration we decided to go towards the south-east and, where that course was impossible, to turn to the south rather than to the east. On August 21st we resumed our journey. During the night heavy rain and then snow had fallen, and in the morning the tents were frozen into such an unmanageable condition that we had to postpone our departure till afternoon when they were fairly dry.

We climbed the inevitable pass, and found on the other side a well-marked track leading down an easy slope into a narrow valley. We had been compelled to leave behind us several loads, and, therefore, sending back for these, we camped at the first spot where we found water (Camp 33). There we overhauled our luggage for the second time with a view to its diminution. There were tinned foods (mostly products of the Bovril Company), superfluous horse-shoes, nails, &c., and two tents which had to be got rid of. The caravan men were told they might take such of these things as they chose, but must eat promptly

whatever eatables they took, and carry on their persons whatever not eatable they wished. Things not disposed of in this way (mostly tinned foods) were packed in superfluous yak dans and deposited in a *cache* dug on a dry site within an old sheep-pen, about 350 yards south by west from Camp 33. They were piled in a square heap and covered with a thick roof of earth and stones, which might serve for a protection against wild animals and possibly also for a landmark to other travellers. The two tents were given to the caravan men. At Leh these men had received an allowance for the purchase of clothes for the journey, but in most cases the money had been spent for other purposes. Ladaki caravan men have strong confidence in *Kismet*, or fate, and in the sahib whom they serve, expecting him at all times and in all circumstances to provide them with food and raiment. In Tibet warm clothing is absolutely necessary, and the men who, before starting, had, in reply to my inquiries, said they were "well provided," or "no matter," now eagerly scrambled for the tent canvas to mend their dilapidated garments.

Resuming our march, we followed the continuation of the track which we had found in descending from the pass, and hoped that it would lead to some native encampment. This hope was disappointed, for, after a few miles, the track became invisible. Further search revealed many smaller tracks, running in different directions and indicating, apparently, not the path of human beings, but of kyang. We saw abundance of excellent grass, but no water except that of a lake which, lying out of our route, was more than a day's march distant, and, for all we knew, might be salt or otherwise undrinkable. After having failed to obtain water by digging, I walked to the top of a low ridge about a mile distant, and saw a pool not far off. Before it was quite dark the caravan was

able to reach the spot, where we obtained water in abundance, but not of very good quality.

Pike was now very unwell and weak. He had persevered in the march through sheer determination, and, when he regained the camping ground, sank utterly exhausted. A little rum, undiluted, proved an excellent restorative. The scarcity of water in this region seemed remarkable, for there was abundance of grass for miles around. The grass was mostly of the peelee sort, in which our transport animals luxuriated, and Ramzan petitioned for a day's rest on their account. This request was readily granted, but chiefly on account of Pike's illness. This day's rest provided the caravan men with an opportunity of renewing or repairing their apparel with the tent cloth, while I went out to reconnoitre. From a commanding hill-top, about seven miles distant, I could see grass in all directions, but the only water visible was at a spot far off and well to the west of south. It seemed to belong to a river, running in a wide valley whose direction, like that of most of the main valleys, lay east and west. But the river course, the further east it was followed by the eye, became fainter and fainter, as if a porous bed absorbed the water. We were unwilling to turn westwards, and settled that we should strike the channel several miles below the point where the water was seen. Water might be found by digging, but, lest this hope should fail us, the men were advised to drink copiously and to fill their bottles before starting. Pike, still weak, set out early, so as to get over as much ground as possible before the heat of the day. When I overtook him, he had reconsidered our plan, and was now strongly in favour of changing our direction. This we did, and, towards evening, camped (Camp 35) at the foot of some outlying hills on the north side of the broad valley I had seen the day before. No water could be found near the

place, and the water at Camp 34 had proved to be so strongly impregnated with soda that all the men, except Leno, arrived not only thirsty but with empty water bottles. From a neighbouring hill we saw a large herd of yak several miles off, and it seemed therefore probable that water was within reach. Dass and two of the caravan men, thinking they saw water at the foot of the mountains on the north side of the valley, set out for a supply with all the empty bottles. It was now late, but there was clear moonlight during the greater part of the night, and the conformation of the hills supplied unmistakable landmarks. It was not till noon next day that the three returned, and they came from the quarter opposite to that towards which they had set out. They had only been partially successful, and had been able to fill very few of the bottles. From the highest hill-top near the camp I carefully examined the country in the direction where the yaks had been seen, and discovered some tents at a distance of a few miles. Being in doubt whether the owners of the tents were harmless nomads or professional robbers, we thought it would be imprudent to be quite defenceless in visiting them, and therefore three or four of our number were provided with arms. Our approach evidently caused much alarm, and the nomads, hastily collecting their large flocks, drove them away. The encampment itself, however, consisting of about seven wretched tents, was left standing, and the occupants received us in the calmest manner.

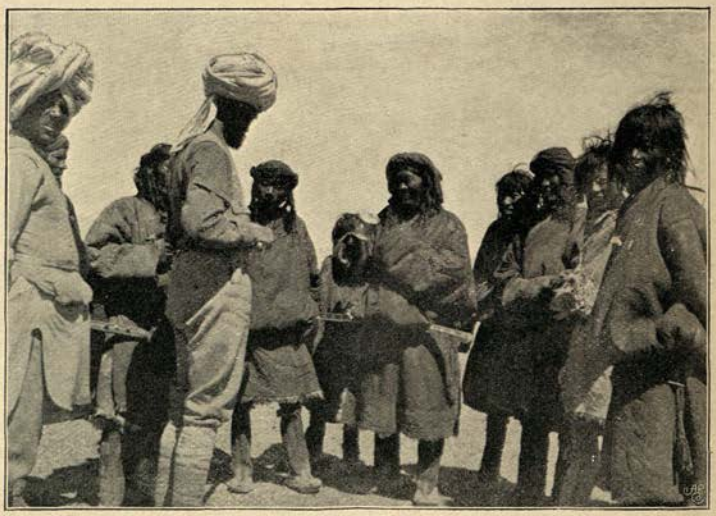
One man, who was making a numnah close to the springs, occasionally glanced up at us, but never stopped working. Having quenched our thirst with the excellent spring water, we gradually introduced the topic of guides and transports. The progress of negotiations was slow, but at length one man seemed disposed to sell us a yak, while another was willing, for the modest sum of two

hundred rupees, to guide us to the nearest large encampment. This offer was, however, refused. Before the bargaining for the yak was concluded, the chief of the nomads appeared and not only forbade the sale, but commanded that no sort of help should be given us. He said, truly enough, that it was against the laws and customs to permit strangers to enter the country, and that he and his people would be severely punished if they supplied guides or transport. This obstructionist was obdurate, and would accept neither payment nor presents, nor even listen to our proposals. He said that the Deva Zung, the official head at Lhasa, was a god, and would certainly know of any transaction between him and strangers. No doubt one cause of his determination was distrust of the men in his own neighbourhood. Tibetans have little confidence in their countrymen, and this chief would not run the risk of being denounced as a receiver of bribes, and subjected to the severities inflicted on such delinquents.

So far as the possession of coin is concerned, these nomads are exceedingly poor, and, indeed, in the ordinary course of things, have seldom occasion to use money. They are in a condition similar to that of the inhabitants of the Caucasus, whom I observed, when travelling through that country in 1893, to have no adequate notion of the value of money. Still, the Tibetans require arms and ammunition as well as barley and other supplies from India and Ladák, and the means of purchasing these things are provided mainly by the sale of wool and salt, the chief products of Western Tibet. The use of money is thus known among them, but yet the offer of sums which must have appeared large, scarcely tempted them to run the slightest risk.

It was not easy to make out whether the stolid manner of these men was due to the affectation of indifference

commonly practised by Asiatics, or merely to intellectual stagnation. Nothing could surprise them. Arms were of importance to them and they had never before seen a magazine carbine, but our carbines excited no interest nor curiosity. A fine blue rock pigeon having alighted to rest and drink at a spot within range, Pike took the opportunity of showing the precision of his weapon, and shot the pigeon, but not one of the Tibetans evinced



THE AUTHOR RECEIVING TIBETAN VISITORS.

the slightest concern in any way. Our negotiations for guides and transport were quite abortive, but Ramzan induced three of the nomads to return with us to our camp. Hoping to obtain some advantage from these visitors, we enjoined Ramzan to see that they were hospitably entertained.

The three were fed, and were supplied with the weed honoured by Ladakis with the name of tobacco, but they

would agree to none of our proposals, and all we could obtain was a promise that some of them would return next morning. We recognised that we had made a mistake in visiting the nomads instead of sending Ramzan and a few Ladakis, who would have been able to allay suspicion. We got neither guides nor transports, but had to content ourselves with information concerning the best route to the large encampment at Gerge. For the sum of five rupees, paid by my own hand, one of the nomads pointed out to Leno and Ramzan the general direction which, he said, should be taken. This, as it was subsequently pointed out to me by Leno from a neighbouring hill-top, was by no means in accordance with my ideas of the best natural line to follow, but the Tibetan alleged that by this route alone water would be found.

On the morning of the third day from our arrival here, we resumed our journey. Pike started early and, several hours afterwards, when the mules and ponies had returned from watering at the nomad camp and Ramzan had reported all present, I set out alone. Going in a straight line to strike the route which had been pointed out to me, I reached, in about five hours, a pool of muddy water which I supposed indicated the spot intended by the Tibetan for our camping-ground. After a light repast of bread and meat with muddy water, I set out to climb the adjacent mountain, hoping to obtain a good view from the top; but here the prospect was interrupted by other hills, and it was not till I had climbed another and then a third summit that I could survey the region. Through the clear mountain air I could see in the far distance kyang and antelopes, but neither near nor far off was there any signs of mules or ponies. Water, as I understood, could be found only on the proper route. There was abundance of water at the spot where I had

halted, and I could not suppose that I had taken the wrong course. I filled my bottle from the pool and started to look for the caravan. It seemed most probable that it was moving along a neighbouring valley which I hoped to cross before daylight failed. I pushed on, but could see no living thing except kyang, which inquisitively circled about me, and before I had gained the near side of the valley, darkness overtook me. The place was bleak and barren, producing not even the familiar boortza, which would have served at least for fuel. I had no food, and no drink but muddy water; I could light no fire for warmth or for signal, and in these circumstances I had to face the unpleasant fact that I was lost.

CHAPTER IV

Lost in the desert—Found by Pike—Sudden ending of a river—Reconnoitring—Entering inhabited country—Gerge—Negotiations with Tibetans—Inquisitive—Medicine useless—Enemy strongly reinforced—No assistance obtainable—We decide to start at all costs—Expected fight—Peaceful departure—False news—Gerche—Arranging for transport—Natives willing to assist us—Fear of severe punishments—Compelled to return to Ladak—Departure from Gerche—Alternative routes—Difficulty of surveying—Scarcity of grass and water—Dreadful sore backs—Treatment of wounds—Record Ovis Ammon head.

MY first thought was to seek protection from the cold wind in some dry water-course, where I might sleep till the moon rose; but this purpose had to be abandoned owing to the lowness of the temperature, which chilled me and kept me awake. In the course of our journey we had recently descended about 1,000 feet, and as the air at the lower level was of course much warmer than at the greater altitude, I had temporarily discarded a good deal of my woollen underclothing, and had even laid aside my gloves. Consequently I was exceedingly sensitive to the cold night air, and, to prevent complete stagnation of the blood, was obliged to keep moving on. Feeling hungry, I tightened my belt and then wandered on in the dark up the valley. I shouted often, and now and then fired a shot in the hope of attracting attention, but echoes were the only reply. After some hours the moon rose and I had sufficient light to search for the track of the caravan.

I ascended to the narrowest part of the valley, crossed and re-crossed it, and made a minute examination, but there was no indication that the caravan had been there. This was exceedingly disappointing, and made it necessary to change my course. I was now tired, somewhat footsore, and very hungry, but, to avoid frostbite and other evils, I was obliged to continue my exertions. I had then, as always, the chronometer watches in my belt, but I never carried a compass lest it should affect the watches. I had therefore to guide my course by the stars, but, as the night was clear, I had no difficulty in making sure of my direction. My only physical comfort was the water-bottle; its contents were muddy, but to a parched mouth an occasional sip was refreshing. I felt thankful to Providence that my fellow-traveller, Pike, was a man worthy of absolute confidence, whom I knew nothing would induce to leave the neighbourhood till I was found. This assurance kept up my spirits, and I sought a short-cut over the hills to the point from which I had started at dusk. The moon was often hidden behind mountains, then it disappeared altogether; the way was dark and rough, but I stumbled on, generally only half-erect, sometimes falling over stones or sudden inequalities of the ground. Occasionally I had to rest for a few minutes, but the cold wind chilled me to the marrow. The minimum temperature registered at the camp on that night (August 28th) was 22° F., a temperature low enough to cause keen discomfort to one thinly clad, hungry, and facing a stiff mountain breeze. I have often, in other circumstances, watched for daybreak, and welcomed the rising sun, but never before with such anxiety as on that morning. In the grey dawn I reached the spot whence I had set out to search for the caravan, and, resting a few minutes, I looked down the broad valley and thought I could discern through the morning haze the smoke of our camp-fire. In

this case the wish might easily be father to the thought, but, as I gazed more intently, the vapour partially dispersed, and I was certain that the appearance of smoke was no illusion. The distance, however, was several miles, and, as I was weak through fatigue and hunger, I had frequently to halt. The tall column, rising vertically from the camp-fire through the peaceful morning air, was full of interest, suggesting food and rest and every comfort. As I plodded on, my eyes were fixed upon it, and so absorbed was I in its contemplation that it was almost a surprise when, about half-past eight, I saw Pike and one of the caravan men on mules close beside me. They had brought, among other supplies, the favourite restorative, a mixture of rum and water. This proved highly beneficial and I remarked that, for one in my weakened condition, the proportion of spirit was judicious, and did not err on the side of too much, to which Pike laughingly retorted that even in my weakened condition I liked my liquor strong, for the bottle had contained more rum than water. Having had a hearty breakfast of cold meat and biscuits, I climbed the mule that Pike had ridden and, with feelings of relief and general goodwill, rode back towards camp. About eleven o'clock we approached the caravan, where most of the men were seated round the fire. They came streaming out, salaaming to me and expressing their hopes that I had not suffered much from spending a night in the open air. Towards them, however, my gratitude was not overflowing; I replied that my absence seemed to have caused them no anxiety, and that they evidently cared nothing for their sahib so long as they were supplied with food and other comforts.

I at once agreed to Pike's suggestion that we should halt for the day, and soon I was sound asleep on Nature's couch, the ground. The bare ground, if fairly dry and moderately free from stones, provides an admirable

sleeping-place, and, after considerable experience in various parts of the world, I have no sympathy with those who regard as a hardship the necessity for this use of mother earth. Travellers should not put themselves to needless inconvenience. Captain Younghusband gives good advice when he says, "Travel as comfortably as circumstances will permit," and comforts should, when possible, be extended to the subordinate members of the caravan. But often the inconvenience of unwieldy baggage far outweighs the benefit which the cumbrous articles can give, and the luxuries which can most easily be dispensed with are such things as camp-beds, chairs and tables.

The river beside which we had camped was the Damtang Lungpa. Near Camp 35 it had sunk so far into the ground that the water could not be reached, but here it had a fairly broad channel and we had no anxiety on the score of water. As we proceeded along its right bank, we passed numerous disused workings (probably for gold) all very close together, and many of them communicating with each other. The openings were very small, varying from about two and a half to four feet, and the depth of the deepest shafts was about or (at least in one case) rather more than twenty feet. Hares were plentiful at this place, and from the general appearance it was clear that the digging had been abandoned for several years. Further on, after a short march we found that the river again disappeared within the porous earth, and, for the sake of obtaining water, we had to camp. The aspect of the surrounding country was gloomy, and the lofty mountains seemed to bar the way towards the large Tibetan encampment of which we had been informed. In the direction we proposed to take we could find no indication of water, nor even of moisture, till Pike, having made a long reconnaissance, saw, from

a commanding point, a small spring to the east of our intended course. Before striking our tents at Camp 39 we noticed a solitary Tibetan approaching, and sent one of our men to invite him into the camp. The visitor pretended to be in search of ponies which had been stolen, but we had no doubt that news of us had reached Gerge, and that this man had been sent from head-quarters to watch and report on our movements. After

TIBETANS BRINGING PRESENTS.

some well-feigned unwillingness he agreed to lead us within sight of the tents of Gerge, which, he said, were distant two days' march.

After this agreement had been concluded we set out, the animals being heavily laden, though all of them were very emaciated, and half of them had troublesome sores on their backs. Ramzan, with his usual want of judgment, intended that the caravan should cross a lofty

pass and travel several miles beyond it to the next camping ground, but this arrangement was discovered in time, and we turned aside to the spring which Pike had seen the day before. The spring-water proved unfit for the use of man, and, as there was too little of it to be of service for the animals, we had to ply the pick and spade to procure a sufficient drinkable supply. Another day's march, during which our guide stuck to us, brought us almost within sight of the native encampment at Gerge, and then the Tibetan speedily disappeared. Here were numerous flocks of sheep and goats, and, far apart from these, at the east end of a long, narrow, salt lake, and close to a small marsh, we found a few tents with inhabitants. We pitched our camp on some dry ground, slightly above the level of the marsh and close to a small hole, from which all the drinking-water of the encampment had to be lifted with ladles. After we had erected our tents and had begun to enjoy the shelter they afforded against the rays of the sun, a petty official came to Ramzan to inquire who we were and where we meant to go. Ramzan, who, like other Argûns, was quite accustomed to lying, gave, without hesitation, a circumstantial account of our proceedings. Pike was a merchant returning from Turkestan to Batang, and I was a skilful medicine man willing to be of service if there were any sick in the Tibetan encampment. How the statement regarding Pike's status was received we were not informed, but the offer of my assistance was promptly declined. They had a medicine man of their own and would have nothing to do with a stranger. This was unfortunate, as medical practice among them might have served many useful purposes. During the afternoon some Tibetans became unpleasantly inquisitive, manifesting a strong desire to inspect and handle everything they saw, and for some hours they hung about the tents. I was disinclined

PIKE ISSUING RATIONS.

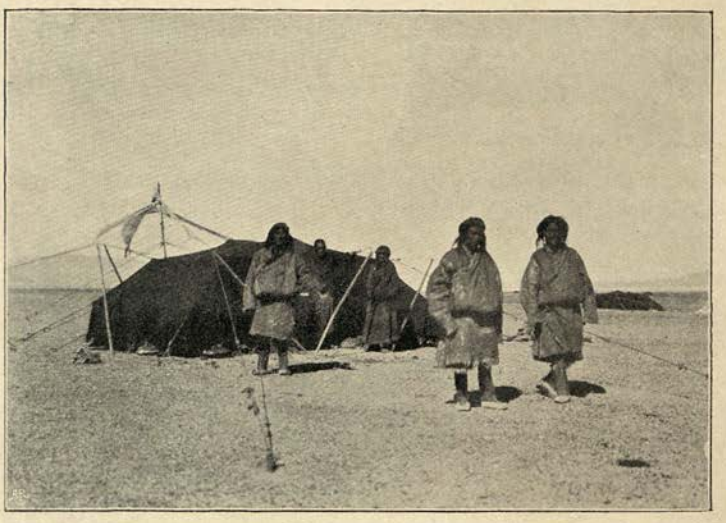
to be communicative, being engaged in some computations, and, perhaps observing this, they bestowed most of their attention on Pike's quarters.

Our visitors were greatly surprised at the smallness of our company. They told us they had been warned to look out for a force of 2,000 men, commanded by twelve European officers, and had received orders to turn it back at once. Where, they asked again and again, were the rest of our men? We gathered that exaggerated information concerning our expedition had been sent to Lhasa long before our departure from Leh, and that strict orders, followed by a reminder every fortnight, had been dispatched from the Tibetan capital to all the Pombos in Western Tibet to watch and regularly report on the movements of this force. The Pombos had searched all the known routes, and we had only avoided their attention by finding a route for ourselves. Ramzan protested in vain that these reports were false, and we fell more and more under the suspicion of being concerned in a subtle scheme for the invasion of the capital. One of the caravan men, however, was equal to the occasion, and, having struck up a warm friendship with a Tibetan visitor, assured him in the strictest confidence that the remainder of our force had been packed away in the yak dans and baggage.

This explanation, repeated in the Tibetan encampment, proved highly satisfactory, and, thereafter, we and our belongings were regarded with respect and awe. We, in turn, were surprised at the smallness of the nomad encampment at Gerge, but subsequently we ascertained that this name was applied not merely to this spot, but also to the adjacent tract of country where the numerous valleys afforded shelter and concealment to many other groups of tents with a considerable population.

About dusk the visitors retired to their own tents and

left me quite free to pursue my astronomical work. About daybreak I took observations of the principal peaks, and had my theodolite packed up again before our neighbours emerged from their abodes. During the morning a servant of the Pombo came to make inquiries, but we refused him an interview, telling him that if his master wished for information he ought to come in person. Through our caravan men we ascertained that there was



A TIBETAN TENT.

in Gerge, a Kulu trader on his annual visit for the purchase of wool and gold, and that he had a pony which he was willing to sell. We were seriously in want of transport, having lost by death or robbery forty animals, while of the twenty-six remaining half had sore backs. The pony offered to us was not young, and the price asked was exorbitant, but we concluded the bargain, paying 50 rupees down and giving a cheque on a bank at

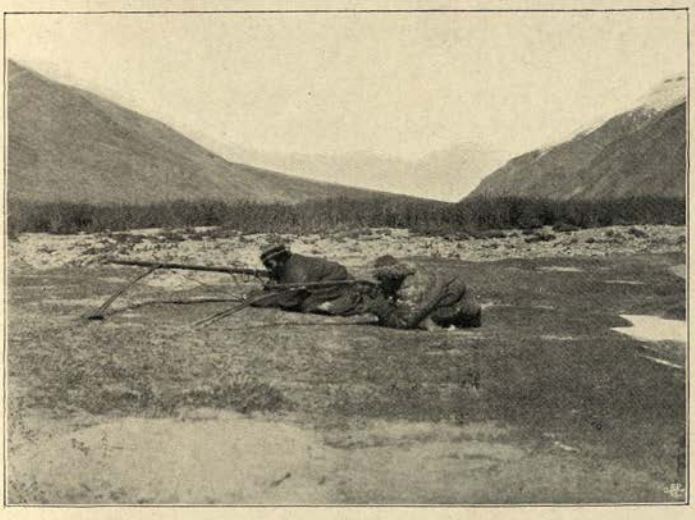
Lucknow for another 50 rupees. Gold is not dealt in at Gerge, but at Thok Gerche, a place about two days' journey to the south-west. There, as we were informed, traders bought it at 16 rupees per tola of about 180 grains. This price, at 1s. 4d. per rupee, would be about equivalent to £2 16s. 10d. per ounce. Whether the Tibetans were over-reached would, of course, depend on the purity of the gold.

Pending the arrival of the Pombo, Leno was able to execute some topographical work, while I again set up my theodolite and prepared for observations at night to determine the deviation of the compass. For work of this sort, I invariably set up the instrument by daylight, since it was almost impossible to do so with accuracy by lamplight.

Later in the day a messenger came from the Pombo, who had just arrived in the native encampment from some outlying place, and we were informed that, as it was not his custom to transact business in the evening, he would visit us early next morning. We were ready to receive him early next morning, but he kept us waiting. Companies of mounted men, armed with guns and swords, began to appear, and there was a considerable display of force within 100 yards of our tents. The delay of the Pombo seemed due to the desire to impress his own people with a sense of his importance, and it seemed our duty to uphold our dignity in a corresponding manner. When, after noon, the great man was announced, we took time to deliberate, and then sent him word that it was contrary to our custom to attend to important affairs till we had finished out midday repast. Having devoted about two hours to our simple meal, we had a numnah spread for the Pombo in my tent, and invited him to enter and be seated. He had assumed that his company might enter along with him, but, to his displeasure, was

informed by Ramzan, who acted as interpreter, that we could not be induced to discuss any matter of business in presence of his servants. The menials being kept outside the interview went on, and proved eminently unsatisfactory. We told him that we meant to travel towards the east, but had neither the intention nor the wish to go near Lhasa, and we asked him for assistance in obtaining guides and transport. He replied that he could not assist us to travel in that direction without permission from his superiors, and, to obtain this permission, he was willing to send to Rudok. He could not receive a reply from Rudok in less than sixteen days, and we could not possibly wait so long. We told him that we meant to go to Batang, and would set out next day, with or without his assistance. This was mere brag on our part for, owing to the state of our commissariat and transport, such a journey would have been quite impracticable. Moreover, a rumour had reached us, doubtless originated by the Pombo, that a few days' march to the east of Gerge there was a large body of Chukpas. Still, it was necessary to seem resolute. So long as we presented a bold front with some appearance of strength in reserve, the Tibetans were not likely to use force against us. The opposition we met was mostly passive, and the Pombo was evidently taken aback by our reply. He now asked us to wait for five or six days, and asserted that within that time he would be able to obtain instructions from an official of higher rank than himself. We repeated our determination to proceed, and the Pombo further modified his proposals by offering to supply us with food till the necessary instructions should be received. We replied that, if one day's supplies were produced at once, we would accept this offer, but if they were not speedily forthcoming we would adhere to our plans. It seemed evident that this offer of the Pombo was not made in good faith, for we heard no more of it.

The mounted men continued to assemble, and their demonstrations had a very depressing effect on our timid Ladaki caravan men, who plainly showed that, if matters should proceed to extremities, no assistance could be expected from them. Threats, made by the Pombo and his people, were circulated, and we were warned that our progress eastwards could only be effected over their dead bodies. Underneath these attempts at intimidation there



TIBETANS SHOOTING.

did not appear to be very much reality, and I had no doubt that if fighting became necessary our magazine carbines would be handled with sufficient effect to disperse the enemy. Leno had been able to get from the trader, Dilsuk Ram, some information, which at the time seemed credible, concerning the different routes, and we now hoped that this information might be serviceable. Abandoning our purpose to advance eastwards, we agreed

to make for Kangri, where, at the annual fair held in the autumn, we might purchase sufficient supplies and transport to enable us to reach Almora. The position of Kangri we did not know, but, according to Dilsuk Ram, there were three practicable routes leading to it. The most direct route was to the west of south; another lay, at first, to the east of south; and the third, the easiest but longest, lay for two marches in a westerly direction along the valley in which we were now camped. Having decided on the first of these routes, we served out abundance of ammunition to Leno, Sanman, the two Sikhs, Dass, and two of the caravan men, with strict orders that no shot was to be fired except by our command, or in reply to the fire of the Tibetans. Our preparations caused great excitement among the armed men, more than two hundred in number, who watched us from the eastern side, at a distance of about a quarter of a mile. They had their ponies close by, and presented a rather formidable appearance, so that Pike and I thought fighting not improbable. We kept the caravan in close order and went more slowly than usual, that the sheep might not be left behind. To our surprise, no opposition was offered, and we began our advance in the direction Dilsuk Ram had pointed out. Here, however, we could find no track nor any feasible line of country, and we were obliged to turn westwards along the easy valley route. This movement seemed to indicate an intention of returning to Ladak, and explained the finally pacific attitude of the Tibetans.

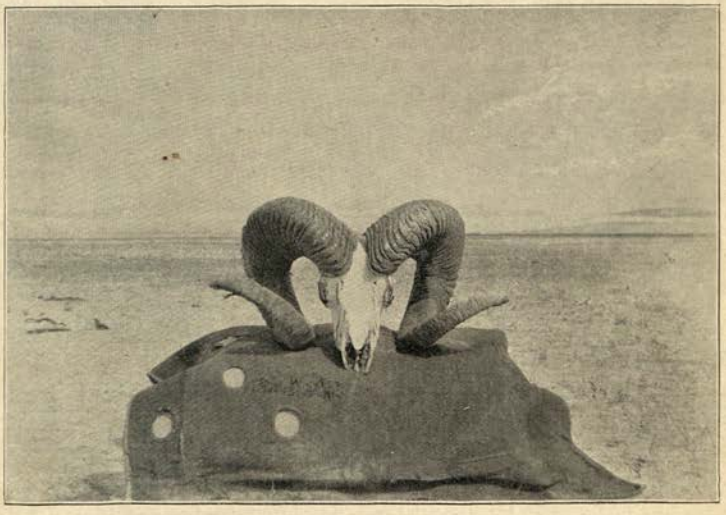
It was necessary now to search for a way across the mountains, and for this purpose we camped at the south side of Lima Ringma Chaka (Long Far-distant Salt-place), beside fresh water and grass. Soon after unloading we observed four mounted men who halted not far to the west, and we despatched Ramzan to ascertain what they wanted. They professed to have been sent to guide us

westwards, but no doubt their chief purpose was to keep us under observation. One of them asserted there was no route southwards across the mountains, but said that his own tent was only two or three marches distant, where he would be willing to sell us some rice. He also promised to guide us towards Kangri if Ramzan would be silent on the subject.

From Thurgo (Camp 45) there was a route leading to Thok Jalung, where gold was said to be found, and to Rudok and Kangri, but the dread of punishment was too great for the man who had promised to guide us, and he now refused to accompany us, even for one march, in that direction. We seriously thought of trying to force our way unaided out of Tibet by the Kangri route, but the difficulties were seen to be insurmountable, and we at length reluctantly agreed to return to Ladak, having received a promise that guides and sufficient transport would be provided for us. There was now a prospect of relief for our exhausted animals and an opportunity of attending to their sores. Neither medicine nor external applications had been of any avail while they were daily loaded with galling burdens, but with other transport in prospect I hoped for permanent improvement. I carefully dressed their wounds, thoroughly washing them and applying a solution of per-chloride of mercury in the proportion of 1 to 1,000 parts of water. This task, which I had to perform with my own hands, was the most unpleasant which fell to my lot during the course of the expedition. The appearance of the sores and their smell were sickening, and, in two or three cases, the lotion applied at one spot emerged through other apertures in the withers and back.

As soon as the fresh transport had been obtained we left Thurgo on the return journey to Ladak, under the guidance of an armed and well-mounted Tibetan escort.

We had not gone far when it became clear that we were to be led by a lengthy route, an arrangement which suited me admirably, as it provided an opportunity for the survey of a wide tract of country. To make sure that this course would be adhered to, I at once vigorously protested against it, and insisted on being taken the shortest way. Being told that, by the short route, the passes were lofty and difficult, I acquiesced, with a bad grace, in the escort's



THE RECORD OVIS AMMON HEAD.

arrangement. By the easier route the passes were of sufficient height to tax our energies, one of them, apparently not regarded as formidable, being 16,700 feet. The large escort rather hampered our movements, and, in the survey work, we had to take precautions against exciting suspicion. Leno, attended by two caravan men who carried the plane-table and stand, invariably lagged behind, and contrived to elude the attention of the

Tibetans, who only asked why these three men were always condemned to carry loads so that they arrived in camp after every one else.

As we proceeded it became difficult to find good water, and, afterwards, water of any sort became so scarce that, but for the guides, we should scarcely have been able to find it. The tiny springs were generally concealed in narrow side valleys; grass also became scarce, and our wretched animals fared so badly that two of them had to be shot. We found several skulls of *ovis ammon*, or Hodgsoni, and probably living specimens of this sheep were not far off, but time did not admit of our searching for them. One fine head which we picked up near Camp 49 was 57 inches long and $18\frac{3}{4}$ inches in circumference at the base of the horns. This, according to Rowland Ward's "Records of Big Game," which is the standard authority on the subject, is undoubtedly the largest known head of an *ovis ammon*.

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CHAPTER V

Good water—Difficult ascent—Hard work—Departure of our escort—Mountain sickness—Game very wild—Misled by guide—Annoying ponies—Trying ascent to a hill station—News of Chukpas—Guides propose an attack—Division of spoil—Keze Chaka—Halwa—Enforced short marches—Bad state of transport—Feelings of Tibetans towards Europeans—Pombos—Taxes—Curious behaviour of sick mule—Dusty camp—Frozen ink—Waterless camp—Strange river—In search of Rundor—Flashing signals—Reliable news of Rundor.

IN this part of the country good water was difficult to find, and day after day we were obliged to content ourselves with such natural solutions of salt and soda, or such muddy mixtures as the neighbourhood supplied. We could think of no method of removing the salt and soda, but by boiling the muddy liquid and adding a mere pinch of powdered alum a fairly clear water could be obtained. The privations of the wilderness, however, have their compensations, and the springs of water, fresh and pure, on which we at length lighted not only relieved our anxiety, but gave such keen enjoyment as only those who have suffered from similar inconvenience can understand.

About a week's journey from Thurgo we approached the fine snow-clad mountains of Lari Fobraug, or Lari Phai, and spent some time in measuring bases and observing the height of this as well as of Thachap Gangri

and other prominent peaks. All such mountains are closely associated with the ancient religious worship of the inhabitants. The wild forces of nature are personified and deified; the goddess Devi especially is supposed to haunt the summits and the passes, where wind and frost and snow are in the common course of things. At the head of each frequented pass, travellers are supposed to make some offering to this divinity. It may be only a rag, a scrap of sheep-skin, or a stone, but in some places mounds or pillars of stone have been erected; and in others the structures are of the skulls of animals.

At Kunzum (Camp 51) we halted to give our beasts of burden a two days' rest, and as soon as our escort heard of our purpose they announced their intention of departing. The direct route to Ladak, which we had professed ourselves desirous of following, lay by Rudok, a place which the officials at Gerge and Thurgo seemed determined that we should not visit. The longer route gave us better geographical results, and the escort, perceiving that we were not likely to alter our plans, relieved us of their company but left us the guides.

At Kunzum the valley afforded good shelter from the wind, but was so narrow as to render the measurement of a base-line rather troublesome. On the hills above the camp, where the wind was high and the temperature low, our work had to be accomplished under great difficulties. Leno and I observed and recorded by turns, but even with this division of labour the exposure was prolonged, and resulted in chills which necessitated recourse to the medicine chest. Survey work was diversified by attention to the uncomplaining animals, whose sores I washed and dressed, while Pike went out to make provision for our larder. Yak were plentiful in the neighbourhood, and one day, looking from a hill station, I

noticed him busily discharging his carbine at a fine animal which would not yield. The stream of ·303 bullets appeared to have no effect except to enrage the yak, and Pike's ammunition was soon exhausted. The attack had begun in a narrow valley with steep sides, where there was not very much chance for Pike if his weapon failed him, but he contrived to reach a large projecting rock inaccessible to the pursuing yak. His urgent signals showed that he was in straits, and I at once dispatched Nurbu (the Ladaki shepherd) with ammunition, which he speedily delivered. The next report of the rifle was the death-knell of the animal which had made so good a defence. After the carcase had been skinned and cut up, we went in search of another yak which had been wounded. For a couple of hours we tracked him and a third which had joined him, and at last I was able to get a long shot, but he galloped away as if uninjured.

The effects of the atmospheric conditions at these altitudes seemed curiously inconstant. Here, at 16,630 feet above the sea, most of the Argûns complained of headache, though at greater elevations they had suffered no inconvenience. So distressed were they now that they refused to partake of the fresh meat which was their favourite food. Leno, on the last day at Camp 51, was also ill, but Sanman, Dass, and the two Sikhs were not affected. Those of our company who smoked found some difficulty in gratifying their taste. The pipe was easily lighted, but vigorous suction was required to keep the smouldering fire in existence, and the violence of this exertion seemed more than the satisfaction was worth, so that even habitual smokers like Pike were content with an occasional whiff. Being a non-smoker I was not troubled in this way, but I was annoyed at the serious reduction in the illuminating power of the candles,

SOME OF OUR TIBETAN ESCORT.

and also by the diminution in the heat they gave out. The latter may seem a matter of small account, but it resulted in wax clogging the candle-holder and blocking the upward passage of the flame.

Between Thonchu (Camp 40) and Kunzum we had seen little or no game, a fact which seemed attributable not to the presence of nomads but to the comparatively low altitudes. Bower, in the narrative of his plucky journey across Tibet, states that antelope are seldom found below 15,000 feet, and we in our wanderings never saw one at a lower level. Here they were in great numbers, but were so wild that we could seldom get within range for an effective shot.

At Chukyar (Camp 53) I was fortunate enough to shoot a fine bull yak after a long and rather exciting stalk. The temperature was very low, and in skinning the carcase we had to keep ourselves warm by means of a fire of dry dung, which was fanned into a glowing mass by a steady breeze. In the process of cutting up, however, we found the natural heat of the animal's body sufficient. The men took to camp as much meat as could be used and also as much as could be carried on our next march, but they were developing a taste for sport, and next day they shot another yak. Only the threat of depriving them of their ammunition could make them believe that we objected to wanton slaughter.

Usually Pike or I went on ahead of the caravan, the guides having explicit and often repeated instructions to halt at any place, which they considered suitable for camping ground. After leaving Camp 56 I was eager to reconnoitre, and with one of the guides pushed far in advance, hoping to obtain from a commanding height a good view of the surrounding country. We reached a spot with a few small pools of moderately good water and plenty of grass, where my guide signalled to me to

halt. He promptly removed the saddle from his pony and I speedily followed his example, supposing that this was to be our resting-place for the night. We took our frugal midday repast of bread and meat, and then, leaving our animals loose among the grass, set out on foot towards some adjacent hills. When we had finished our reconnaissance we returned to the pools, but found no sign of the caravan. In my eagerness to explore the neighbourhood I had thought too little of the weakness of the transport animals, which now with difficulty could travel ten miles a day, a distance which my guide and I had exceeded a good deal. We therefore sought our ponies, but they, rejoicing in their liberty, would not be caught. They seemed to delight in the annoyance they gave, circling round us and approaching so near that I could once or twice touch them but was unable to grasp the head collar. I succeeded at length in getting hold of the guide's pony, but all efforts to catch my own, which was of stronger build, failed. The large saddle I placed on the small pony, balancing it carefully, for the girths were quite useless, and then rode slowly back, attended by the guide, who carried his own saddle, while my pony gambolled round him at a few yards' distance.

At Camp 57 our caravan remained two days, while Pike went on to Charol or Shemen Cho to boil thermometers and obtain a view of the region through which we should have to pass. Leno and I devoted ourselves to climbing mountains, sketching, and looking for sites for hill stations. To the north-east of our camp there was a lofty mountain which commanded a wide tract of country, and we had no doubt of finding on it a suitable spot for one of our stations. For the second, however, we had more difficulty in discovering a convenient place. Leno, attended by a number of men, took the theodolite to the

mountain on the north-east, and I set out with one man towards the south-west where there was a lofty range which seemed likely to suit our purpose. For a long time I struggled to reach the top, but the sides were of loose shale and very precipitous. I dreaded having to return to camp baffled, and for hours kept perseveringly at work until I was rewarded by reaching the crest, where I was able to identify Lari Fobrang and other

PIKE SHOWING CAMERA TO TIBETANS.

peaks which had been fixed. The men with Leno on the opposite side of the valley, many miles distant, had been told to keep a good look-out for me, and so well did they carry out this order that before the pillar at my hill station was complete, it was used as a point in Leno's observations. Next day the theodolite was with great labour carried to this new station, and careful observations were made, which completed the geodetic measurements at this camp.

Before we left Camp 57 a few Tibetans arrived with supplies for the guides and the men in charge of the yaks. The coming of these men seemed to cause a good deal of excitement, which was explained when Ramzan found leisure to repeat to us the news they had brought. It was reported, he told us, that two of the Chukpas who had been hit by Utam Singh near Camp 31 had died. The Chukpas were much dreaded by the peaceful Tibetans, and the tidings gratified and cheered the guides, as well as inspired them with a wholesome respect for the carbines. The report seemed the more satisfactory to the natives because they believed there was then a band of Chukpas in our neighbourhood. Our visitors professed themselves most eager to attack the robbers, and we were interested in eliciting their plan of campaign. Their idea of fighting was to send us to make the onslaught while they remained behind to defend our camp. After this division of labour the plunder was to be divided also; we should hand over the yaks and sheep to our allies, and retain the mules and ponies for ourselves. To the simple Tibetans the arrangement seemed just and fair, especially as without the information they had given we should not have known that the robbers and their booty were at hand. Our guides and their friends were grievously disappointed when we told them that we had no quarrel with these Chukpas, and would not attack them except in self-defence, or for the recovery of our goods.

The visitors soon departed, and the guides, when free from the constraint of their presence, became quite friendly towards us. One of them was especially cheerful and hard working, and both assisted in building pillars on points of observation. They, of course, did not understand the purpose of the pillars, but were satisfied with Ramzan's answer: Sahibs are strange people; they do strange things, and give strange orders; but their servants

must obey. Unfortunately, Ramzan, like many better men, did not live up to his own theory of duty.

Our daily fare was plain and admitted of little variety. Usually, for a second course, we had a small shape of rice boiled in water, but at this season on these chill altitudes this was almost invariably served half-frozen. One evening Leno sent to ask us to partake of a sweet dish which his cook had prepared, and this, simple as it was, we found a pleasant change. "Halwa" was its name, and it consisted of flour, ghee, and a little sugar.

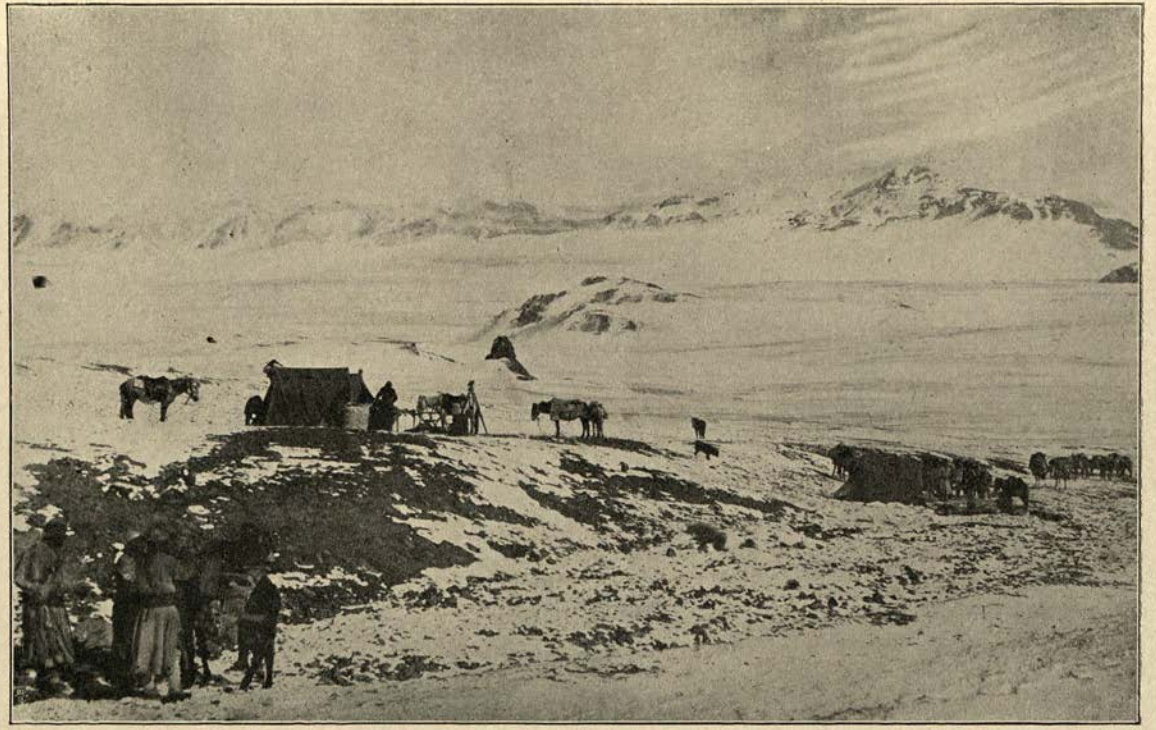
Our marches here were short, for the transport animals, under-fed and over-worked, were very emaciated. From the guides we gained much information concerning the localities, lakes and rivers of this part of the country, and the descriptions we received were afterwards corroborated by a friendly and intelligent official named Nymget Sring, to whom we were otherwise indebted for assistance. We observed many indications of good-will on the part of natives who were not officials, and only the risk of detection by the Pombos prevented them from giving at any time information and active help. Apart from the special purpose for which they were employed, our guides were not uncommunicative, and we could occasionally gather fragments relating to their customs or to the hardships of their daily life.

The Tibetans are poor, and such possessions as they have consist of flocks and herds, yet they are heavily taxed. One tax, collected by the Pombos, is levied in money or in kind at the rate of about 50 rupees for every 300 sheep and six yaks which the natives own. It is understood to be the duty of the Pombos to hand over the proceeds to the Government at Lhasa; but the Pombos are appointed only for three years, and their pay is little more than nominal, consisting of some tea, cloth, and food, so that they are popularly credited with retain-

ing for their own use no small part of the amount contributed by the population. To what persons they hand the balance is doubtful, but it seems probable that the contributions pass through the hands of several grades of officials, and that only a small portion of the total reaches its proper destination. The second tax is collected by the Lamas who, in the case of non-payment, either punish the defaulters themselves or employ the Pombos to enforce the exactions in accordance with the sacred law book of the country. The most common form of punishment is by fine, but imprisonment is also awarded. This penalty, however, is only inflicted in Lhasa and, perhaps, Shigatze, and the criminals imprisoned are mostly thieves. The death sentence is passed only in Lhasa, and only on murderers and spies; it is carried out by tying the culprit in a yak-skin and throwing him into the river.

The manner in which the Tibetans dispose of their dead seems somewhat akin to that in use among the Parsees. The bodies are carried to the top of a high mountain, where they are cut up and left to become the food of ravens.

Tibetan habits are in one respect curiously different from those of European mountaineers. In Scandinavia or in Switzerland, the flocks and herds are driven from the hills to the valleys at the approach of winter, but in Western Tibet the sheep and goats are driven to the lofty ground, when the snow begins to cumber the valleys. The heights are constantly exposed to winds which sweep them clear of snow, so that they usually present some pasture available for the hardy flocks of the country. In these regions there seems to be no great snowfall; on the heights it is certainly slight. We could discover scarcely any trace of avalanches, and, though we sought to determine the snow-line, we could find very



A TYPICAL SCENE IN TIBET.

few data on which to generalise. No well-marked limit could be traced, but probably little snow lies all the year round in Western Tibet under 20,000 feet.

The conditions here were trying for the transport animals, and though relieved of their burdens and carefully tended, some of them became so weak that they had to be shot. One very fine mule, which had regularly carried the instruments, behaved so strangely at Camp 61 that we were concerned about her. When driven out to grass she promptly returned to camp and took up a position close to my tent. Then, showing symptoms of colic, she lay down, partly on my tent, at a spot close to the medicine chest, from which large doses of opium and calomel were thereafter taken and poured down her throat. Having a good constitution and a tough inside, the animal survived both the colic and the medicine.

This neighbourhood contained many lakes which showed signs of a great contraction in area. The salt lake at the west of Kaze Chaka must formerly have been several hundreds of feet deeper than now.* At some places we were troubled with dust, but in this respect Camp 63 was by far the worst.

By the beginning of October the minimum thermometer fell to within a few degrees of zero F., and soon after sunset it was impossible to write with ink. The liquid froze in the bottle unless it was held in the hand, and in that case the drop on the pen nib became solid before it could be transferred to paper. I was obliged to record observations in pencil and subsequently to transcribe them by the camp fire, or in a sunny place screened from the cold wind.

The guides now told us that our way was towards Rundor, which was not far off, but the nearer we approached it, the more uncertain they seemed as to

* See Appendix I., page 389.

what direction to take. They promised to find suitable camping ground with abundance of water, but in this they did not always succeed. At Marchok (Camp 66) the animals had to be provided with water obtained from melted snow. From this point, however, we had a view of a fairly large stream, and the prospect of camping beside it next day kept our spirits up. In the morning we looked for the stream, but could perceive no trace of it; we climbed a stretch of rising ground which commanded a view along the valley, but no running water could be seen. Yet we had not been deceived; the river did exist, but flowed intermittently. At Chagnangma (Camp 67) we found that it was the habit of the stream to visit that spot about noon, and to continue its course during the rest of the day, but promptly to stop when night set in. This peculiarity was doubtless caused partly by the action of the sun on the ice or snow, and partly by the porous nature of the river-bed, but we had not time to make a minute investigation. We attempted to store water by constructing a small dam, in the hope of obtaining a pure supply. But our efforts were vain; as the flow decreased the stored supply vanished through the ground, and we had to be content with the muddy water which came at intervals with a rush as if from a newly-opened sluice.

We wished to ascertain the position of the place called Rundor, whose very existence now seemed doubtful, and was accepted, not on the strength of the guide's assertions, but on the word of Nurbu, the shepherd, who told us that he had visited the place several times, going from Ladak. We therefore sent Ramzan ahead on my riding pony, attended by one of our guides, to reconnoitre, while Leno and I betook ourselves to the work of surveying. We found some inconvenience from the want of heliographs. A small folding mirror had to serve the purpose,

and an alpenstock was used to align the sun's rays so that the surveyor in the valley could make his signals visible to the men on the hill, who in turn, though untrained, were able to use a second mirror with sufficient exactness. Here we spent three days in surveying, and then resumed our march. We had not gone far when we met Ramzan returning from Rundor, accompanied by two natives of the place, which we were told was distant two days' journey.

CHAPTER VI

Ramzan sent to Ladak—His excuse for delaying—Pike's love of cold water—Annoying caravan men—Rundor—"Presents" from Pombo—Fresh transport—Names of places—Large glacier—The Nabo La—Mountain sickness—Sanman again disobedient—The last halt—Cold weather—Accident to theodolite—End of surveying—Strange visitor—Rassoula's "konka"—Grass and fuel very scarce—Death of animals—Our scribe Rassoula—Sending for transport and supplies—Shooting ponies—Arrival of men from Lutkum—Wood at last—The waterless camps—Arrival at Lutkum—Return to Leh—The Zoji La in winter—Frozen to death—End of journey.

RAMZAN and his new friends from Rundor informed us that the Pombo had gone to Ladak to purchase barley and other supplies for his own people, and since in his absence there was little probability of the nomads providing us with sufficient transport for the remainder of our journey, we resolved to act independently of them. Fobrang was the nearest village in British territory, and thither we decided to send Ramzan to procure the necessary animals. By much talking and liberal promises he contrived to obtain a guide, but no pony could be bought or borrowed, and I had to give him mine. We had sufficient food for ourselves and the caravan men, but the barley was almost used up, and Ramzan was instructed to arrange for a fresh supply, as well as for chopped straw for the animals. His orders were to hasten, but he was in no hurry to start, and in reply

to my remonstrances he made such ridiculous and impossible excuses as are commonly used by Ladakis, asserting that he would certainly make up for lost time by travelling night and day.

Our progress to Rundor was slow and on the way we had difficulties and annoyances to overcome. The weather had become very cold, and when, as on the mornings of October 18th and 19th, the thermometer showed a temperature within 3° of zero F., I was tempted to pay less attention than usual to my ablutions. Pike, however, with the rigour of a Spartan, abated no jot of the morning ceremony. My occasional use of water raised by the camp fire a little above the freezing point, was regarded by him as a sign of luxurious softness. He was unmoved by accidents of the weather, and when the water was changing to icicles or when only unmelted snow was at hand, he only rubbed the more vigorously. When our tent was so situated as to catch the first rays of the morning sun, a difference of temperature was very perceptible; but we could not always have this advantage. A trying part of my work was the observation of Collie's portable barometer at seven in the morning and nine in the evening (local time), an operation in which gloves had to be discarded. In unpacking the instrument, in reading its indications and repeating the readings until three of them agreed to within ·004 of an inch, and in again packing up the instrument, a good deal of time was occupied, and my fingers often became so numbed that the work had to be interrupted till the circulation was restored.

Then we had a good deal of annoyance from the want of a moderately competent caravan bashi to see that our orders, which were never exacting, were duly carried out. The men could not be trusted to do as they were told unless they were under constant supervision, and

sometimes their disobedience was provoking. Instructions were given that certain of the animals, being unfit for work, should be exempt from carrying burdens. The orders were clearly understood by the men, and then disregarded. To the worst offender, callous to the sufferings of the mules, I administered two blows with a stick which disconcerted him so much that he lay down on the ground and howled that I had killed him. The lusty voice in which he bewailed his punishment showed that he had received no injury, but ridiculous as his behaviour was, the necessity of enforcing compliance with orders by such means was exceedingly disagreeable.

The two Rundor men whom Ramzan had introduced into our camp were accompanied by two large and ugly dogs. One of them very soon showed a great antipathy to strangers, but as he kept at a respectful distance from me, I thought little about him. As he became more accustomed to our presence he seemed to lay aside his enmity, and when we reached the Churti watershed he appeared quite friendly. But his friendship was feigned, for, observing me defenceless, engaged in the needful work of collecting dung for fuel, he took advantage of the opportunity and seized me by the calf. My position was distinctly disagreeable, but, at length, the brute loosened his hold and I was able to reach my rifle. By that time, however, he was in full retreat and presented such a small and rapidly-moving target that the bullets did him no harm.

Rundor, we found was nothing more than an encampment of nomads. Our guides had led us to believe that it was a very large one, but though, as regards area, it was large, embracing the valley running east and south of Nabo La, the tents, so far as we could see, were few and the population small. No doubt the numerous side valleys which afford shelter and grazing for cattle, and

concealment from the Chukpas, were also sparsely inhabited. Soon after we had pitched our camp at Kamoyogma, the Rundor Pombo's Deputy, Nymget Sring, paid us a visit. He gave us milk and cheese, nominally as presents but really in the hope of receiving a more valuable gift. In our route there were, at no great distance, two rather difficult passes, and our purpose was to cross these and then wait for the return of our men

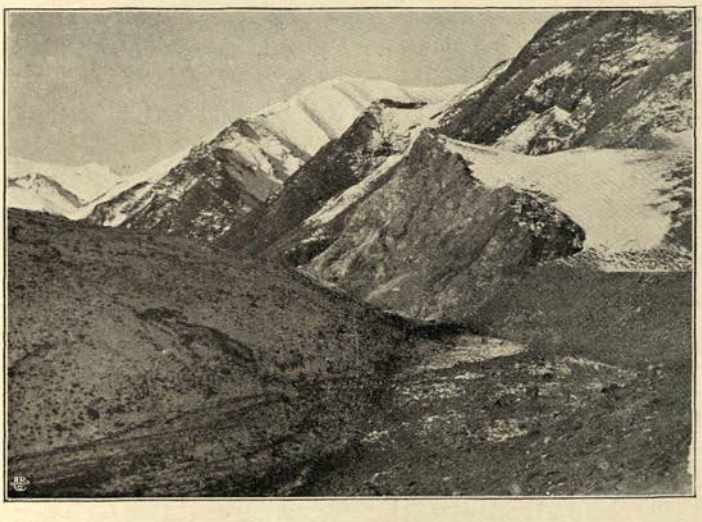
LARGE GLACIER NEAR THE NABO LA (PASS).

from Fobrang. We entered into negotiations with Nymget Sring, and after much talking, he agreed to sell us barley and to supply us with ten yaks at the rate of twelve annas per march for each animal, for at least three days. This arrangement suited us very well and was probably an advantageous one for Nymget Sring. In such circumstances it was the custom of the officials to commandeer the animals or provisions required, but

never to hand over to the owner the payment they received.

Nymget, a cheerful man and well disposed towards us, agreed to accompany us till we should meet the men from Fobrang. Having set out from Rundor, we advanced on the ascent of the Nabo La, and, preparatory to crossing the ridge, camped for the night at Larcha. Here the height was about 17,430 feet, but no inconvenience was felt by any of the men, except Tara Singh who complained of a headache, due probably to an over-abundant meal the previous day. The Nabo La had been mentioned to us as not high, a description which I would not quite adopt. The eastern slope we found gradual and easy. We passed a very large glacier which projects well into the main valley, its foot being at an altitude of about 17,700 feet. Frequent halts were necessary to rest the men and animals, but without too much exertion we reached the top. There we found the usual heap of stones and skulls, and this afforded us some shelter from the cold west wind when we proceeded to boil thermometers for the determination of the height. Two caravan men supplied more effectual protection by holding their filthy and vile-smelling sheepskins round me, and at length the various difficulties in the way of lighting the candle were overcome. The hypsometer screen was so admirably designed that, as soon as the candle was lighted it burned freely and without waste, no additional shelter being required. The hypsometers gave the altitude as 18,880 feet. The aneroid barometer which I carried went below fifteen inches, the lowest point to which it was graduated, and there stuck fast, showing an estimated altitude of 19,700 feet. What height the instrument would have indicated had the mechanism been constructed for greater elevations, it is impossible to say, but the error on this occasion was sufficient to show that for altitudes over

about 18,000 feet, this instrument was valueless. Nearly all aneroids record too small a barometric pressure at great heights: their errors increase with the height, and at great heights no two instruments even by the same maker, when placed under the same conditions, record the same pressure. Their errors can only be detected by comparison with the mercurial barometer, or hypsometer on the spot. As a rule, our aneroid was compared



WATERLESS CAMP NEAR THE AN LA (PASS).

morning and evening with Collie's portable mercurial barometer, but we never used the latter instrument at passes, only in camp.

The Nabo La was undoubtedly the highest point the caravan had reached, but few of us were seriously affected. Leno, Tara Singh, and two Argûns complained of headaches, and Sanman's face and hands became swollen. All of us had to make frequent halts for a minute or two

to regain breath, a circumstance which affected Pike a good deal, and to me was very distressing. Here Sanman, as at earlier stages of our journey, showed himself lazy and disobedient, causing more trouble than his assistance was worth. He would have been much improved by a sound beating, which neither Pike nor I cared to inflict.

Descending the Nabo La, we entered a narrow, rather steep, and very stony valley, from which we passed into a broad valley almost destitute of grass, where the mules and ponies had to subsist on a few handfuls of corn and the little water that was not frozen. Fortunately, as we advanced we found a better supply of grass and water. Here we halted for a day and I completed the system of triangulation by connecting it with Tartary Peaks, Nos. 1 and 2, of the Great Trigonometrical Survey of India. This task I had fortunately accomplished before the theodolite was damaged by an accident. At the hill station here, on October 19th, the cold west wind was so violent that the instrument was blown over, though large stones had been piled round the stand. Leno had partially broken its fall so that it was not irretrievably destroyed, but it was so damaged that further work with it was out of the question. During four months the theodolite had provided me with the means of interesting employment, for few days or nights had passed without my taking either terrestrial or astronomical observations, and now, to my regret, this occupation was gone.

Had it not been for the cutting wind, we might have lingered and admired the panorama of majestic mountains which extended before us, many of their summits being clothed with perpetual snow. At least three of the peaks which we observed were over 21,000 feet in height, and doubtless others were as high. Within the depression which they enclosed lay, Dyap Cho, or Lake Treb, as

Wellby calls it. To the north of this lake was a lofty mountain with rounded summit, the height of which we endeavoured to ascertain; our efforts, however, were unsuccessful as the rounded top presented not one feature which could possibly be recognised from a second station.

Nymget Sring, Rassoula, and some of the caravan men to whom our homeward route was to some extent familiar, asserted that there were no more high passes to cross, only a "konka," or low pass, and two others of insignificant height.

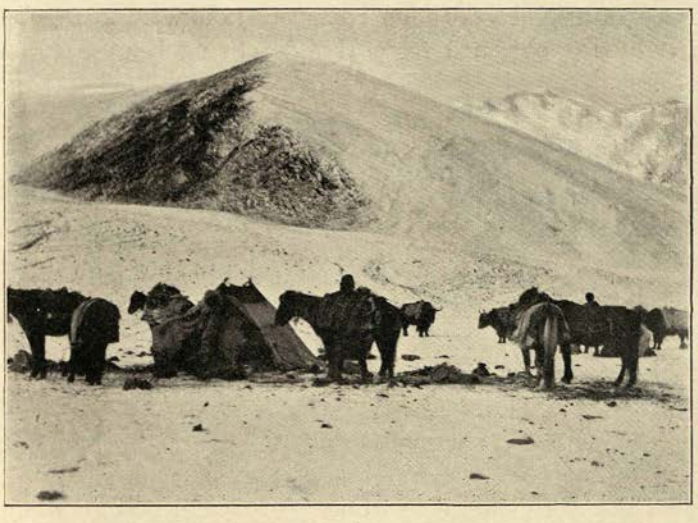
A careful examination which I made of the lofty range west of the Dyap Cho, did not tend to bear out their statement, but still Rassoula persisted in his opinion. We moved on and camped at a cheerless spot, where no fuel could be found and where the stream was frozen to a solid mass. This was at Thakcho Karu (Camp 76), 17,600 feet in height. This place was, in fact, very little below the level of the top of the pass, the ascent being so very gradual that the highest point could not easily be determined. Here was Rassoula's "konka," identical with Nymget Sring's "Kone La" and the "Kepsang Pass" of the maps. Snow had fallen, but not so as to prevent the animals from finding a scanty supply of the langma grass of the region. These dumb servants, owing to daily marches, scarcity of food and water, and the severe cold, were reduced to a pitiable condition. Several of them were frozen to death and many of them had to be shot. In the mornings my first question was, "How many deaths during the night?" When I think of this portion of our journey it seems wonderful that any of our mules or ponies survived to reach Ladak. The few Tibetan ponies we had fared better than the other animals, for they had the habit of pawing the snow till the grass beneath was laid bare, and they hammered

with their hoofs on the ice in search of water, now and then with success. Near the camp there was noticed an unexpected visitor, a bald-headed coot, which had been attracted by the presence of so many animals in the desolation of the mountains. The poor bird, like our beasts, was quite exhausted and was easily caught by the men, who were ordered to put an end to its misery and save it from a lingering and painful death.

Of all the members of our caravan, Rassoula showed the most wonderful imperviousness to cold. In such weather it was important to have proper footgear; boots were undoubtedly the worst, unless so large as to admit with ease two pairs of the thickest woollen socks; but Rassoula, whether riding or walking, would wear nothing in preference to a cast-off pair of my boots, which he never fastened. This man, besides his professional attainments, had some slender accomplishments which made him useful in another way. He was from Ladak, where the language spoken is Bhoti, and he was the only man in our camp who could write a letter in Bhoti. When we were sending to Ladak for help, a letter was necessary to confirm the words of our messenger, and for the writing of this letter the services of our cook were impressed. This work, however, proved almost beyond his powers; when the orders which were to form the groundwork of the epistle were rehearsed to him, he kept muttering to himself and then proceeded to write; but it was easy to see that the words he used were partly Bhoti, partly Hindostani, and partly, doubtless, from other tongues. All efforts to adhere to one language were hopeless, and when, after much labour, the epistle was finished it was very doubtful what its meaning was, or whether it had a meaning. Rassoula could repeat to us what he had been told to say, and doubtless did so, only pretending to read the letter as it finally stood. During the whole of this

labour the puzzled look on his solemn countenance was the cause of much merriment.

In these trying times our spirits were supported by Rassoula's assurance that a "gurram jugga," or "warm spot," was not far off, but this place of comfort was still too far off for our purpose. At Pagrim, where we found a small nomad encampment, the guide who had been sent with Ramzan to Lutkum returned in the company



CAMP AT PAGRIM.

of two Lutkum men, but without Ramzan who, he informed us, was ill and unable to travel. To arrange for assistance we sent Utam back with one of these newcomers, but fresh difficulties awaited us. The Rundor men were naturally impatient to return to their homes. Winter was closing in upon them; there were two passes behind them, and for all their trouble they did not expect to receive one anna. We offered an increase of pay, but

without avail, for all our negotiations were with Nymget Sring and were carried on in our camp apart from the other Rundor men, who, there is little doubt, knew nothing of the bargaining. As soon as night set in these men bolted and took their yaks with them, and, what was vexatious, they went unpaid, so that we had to entrust the money to Nymget Sring, who, with a smile, undertook to satisfy them.

At Pagrim our situation was very dreary, and we resolved to proceed. The transport yaks were now gone, but having obtained from Nymget Sring the use of his two ponies, we loaded these and the other animals heavily and set out. We had to send back repeatedly for surplus baggage, and it took us two days to travel eleven miles to Niagzu. On the hills to the north of the valley there was a large herd of sheep, and on my asking the Ladaki, Changfûnchuk, for what purpose they were driven there he replied, "To get food."

"But," said I, "they cannot eat stones or earth."

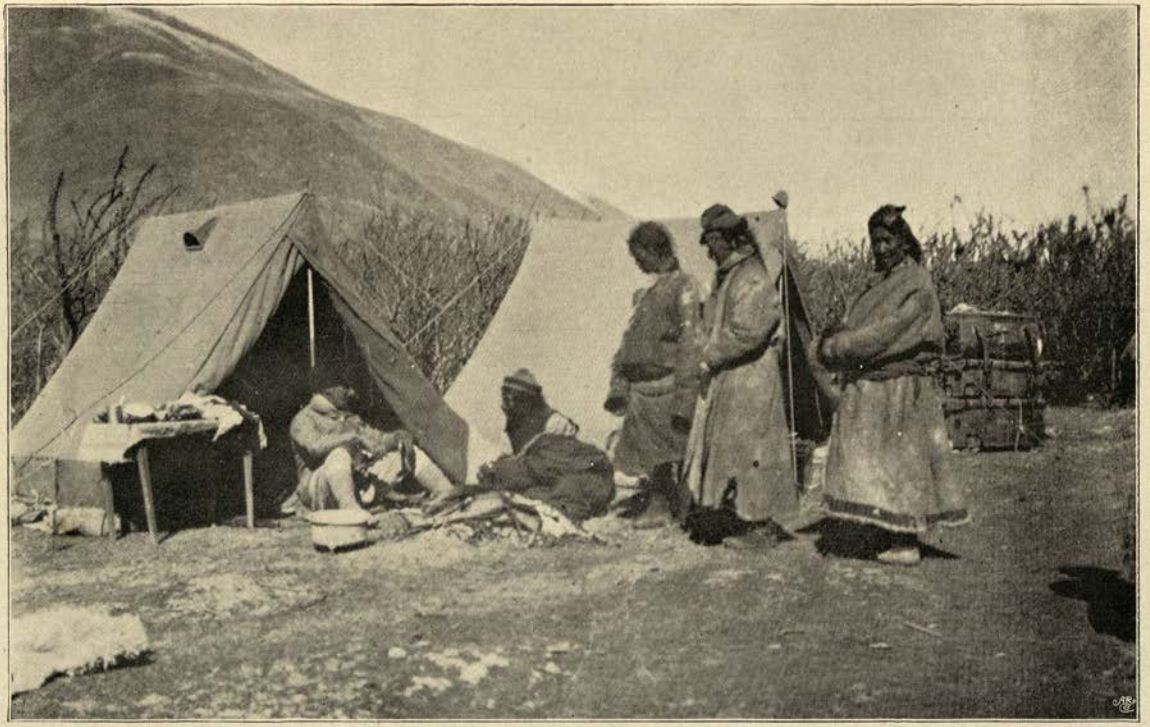
"No, Sahib, they eat grass."

"But they cannot find grass there."

"Oh, yes, Sahib, there is grass between the stones."

The mountain-side was rocky, and I could perceive no green thing, but the Tibetan sheep were used to scanty fare and could subsist in winter on these bleak mountains.

Niagzu was Rassoula's "warm spot." The place was sheltered from the cold west wind by high mountains, and we found a fairly level piece of turfy ground hemmed in on three sides by low trees and tall brushwood so as to form an excellent camping-ground. In a short time we had collected a large quantity of dry brushwood and roots of trees, and all hands indulged in the luxury of large camp fires. Since leaving Tankse on June 1st (five months before) we had found no fuel but boortza and dung, which barely sufficed for cooking purposes,



PIKE QUESTIONING TIBETANS AT NIAGZU.

and we now had unspeakable delight in stretching ourselves at full length on the turf (frozen hard as a rock, but still turf) in front of a blazing fire of genuine crackling blocks of wood. For a time we forgot we were at an altitude of 15,000 feet, on November 1st, but with the temperature at zero F. we came back to realities. We required thick fur coats, and at night we betook ourselves to our much prized sleeping-bags, which left only the face exposed to the frost.

On the mountain-side opposite our camp we saw a large number of ram chicore, which kept calling in the most provoking manner, but all efforts to get near these toothsome birds with a shot-gun proved abortive. However, Changfûnchuk succeeded in bringing one down with his carbine.

In the really cold weather the cordite used for the carbines was so useless that we gave up attempting to shoot. Close to Camp 75 Pike tried to shoot an antelope, but utterly failed, no less than six bullets having dropped to the ground within fifty yards of him. The only purpose to which the cordite could be put in such circumstances was to kill exhausted mules and ponies.

At length the Lutkum men and baggage animals arrived, and we were able to resume our journey. There were still two waterless camping-grounds before us, but at these places barley and chopped straw had been stored ready for our animals, and water was obtained from fresh-fallen snow.

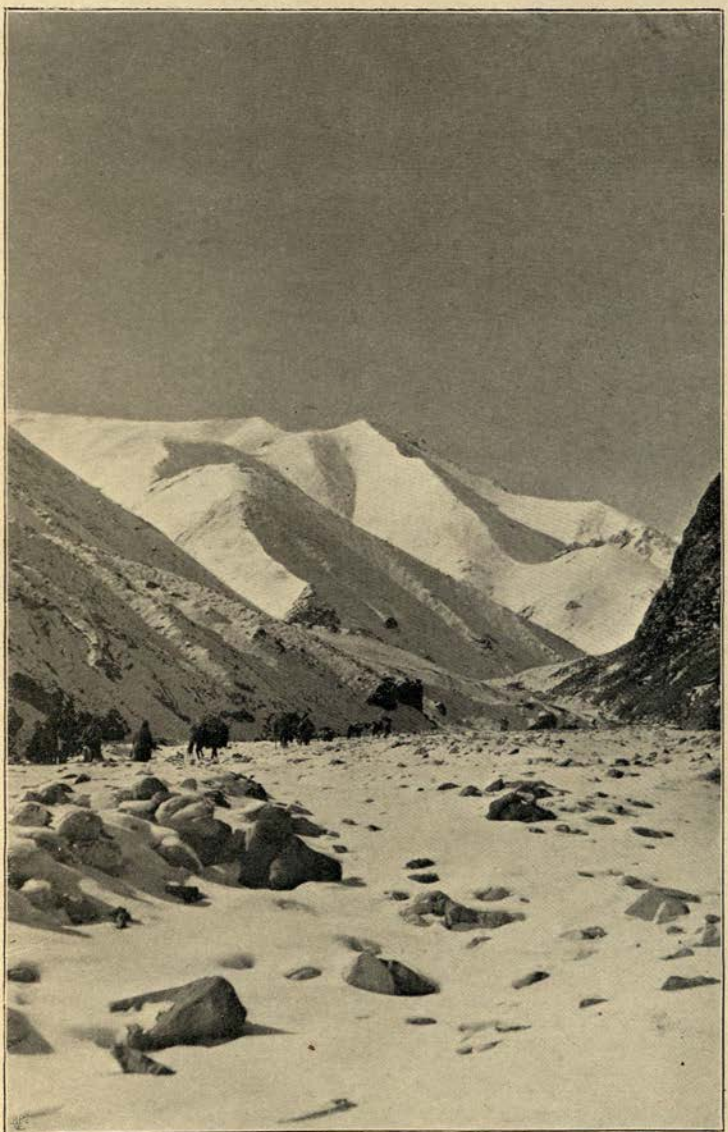
The severity of the weather increased the demand for medicines, but sometimes these were asked for when quite unnecessary. The old Sikh, Tara Singh, was the first to feign illness by a forced and frequent cough; his example was followed with annoying rapidity, and vigorous remedies became necessary. After it was made quite clear that there was no real malady in the camp the

dispensing of drugs ceased, and an order was issued allowing for each man's restoration to health a period of twenty-four hours, after which a heavy fine would be imposed for every cough that was heard. This remedy was more effective than all drugs and cured the camp with marvellous rapidity.

After a long and tiring march, in which we had to cross a pass, high but not difficult, we reached the valley in which Lutkum stands. During the greater part of the last day's march I rode Pike's pony, which he very generously gave me, as I was rather used up, and when it was drawing near to seven o'clock in the evening we entered the village. A great supply of boortza had been collected for us, and other stores were in readiness, but we had to wait for about an hour till we heard the salaaming which betokened the meeting of our Argûns with their fellow-countrymen, and the arrival of our diminished caravan.

Of the sixty-six animals with which we had set out from Leh no less than sixty had fallen victims to the hardships of the journey, or had been stolen by the Chukpas. The remaining six were fit for no greater load than a few of the men's sheepskin coats, and with that they could only crawl slowly along. So low had their vitality been reduced by privation, that for several days they could not eat anything like a satisfactory quantity of the grass or barley, which was now offered them in abundance.

The provisions which we carried for the caravan—suttoo, flour, rice, and bread—lasted till the day of our return. Since the 18th of June, when we crossed the Lanak La, our caravan had travelled 776 miles, of which I had walked more than half. I had still to reach Leh to complete the journey, but there was no longer the need for pedestrian exercise, as the Wazir, Bishun Dass,



SCENE NEAR THE AN LA (PASS).

very kindly had sent a chaprassie to meet us and make the necessary arrangements. Fortunately very little snow had fallen on the Chang La, and having easily surmounted this pass, we reached Leh on November 13th.

I spent a few days in resting and paying off the caravan men, and when all business relating to the expedition had been accomplished, I reluctantly said goodbye to Arnold Pike, who, for the purpose of sport, had determined to spend the winter in Ladak. His genial society had been a source of great enjoyment during the expedition, and to his indefatigable energy and hearty co-operation I was largely indebted for success. But for his care and skill the natural history and bola specimens which we picked up would have fared badly. In addition to rendering such assistance, he had acted as quarter-master, and had, besides, been always eager to reconnoitre, even at times when labouring under physical weakness. He had resolved to remain in Ladak—I had to rejoin my regiment; so with a hearty handshake we parted company and I set out for Srinagar.

There were reports of an early snowfall on the Zoji La, and while I was delayed at Dras twenty inches of snow fell. When the weather had cleared I set out with coolies lightly laden, and four men to act as guides and make a track through the snow. Our progress was at the rate of about a mile an hour, and it took us four days to travel to Baltal, a journey of 31 miles, which in summer I had accomplished in a single day. The pass, we found, was closed even to mail runners, and a number of wretchedly clad women and children from Baltistan, who were waiting to cross, attached themselves to my party. The worst day's march was from Mechuhoi to Baltal, during which we were impeded by a strong wind which blew the fine frozen snow in our faces. Accompanied by Leno, Utam Singh, and a man from Dras, I had set out early

from the rest-house at Mechuhoi ahead of the coolies, and after some hours of weary plodding through the snow I reached the top of the pass. There I almost stumbled over the body of a Sepoy who had been frozen to death. I learned afterwards that my men had noticed him the day before pushing on from Mechuhoi, and had endeavoured to recall him. The poor man, clothed in the thinnest rags, had evidently reached the spot after dark, and before attempting to descend the steep snowy slope had sat down to rest. He had removed one puttie, and had partially removed the other, and then had been overtaken by the fatal sleep. The snowfall not having been as yet sufficient to fill up the bottom of the narrow gorge, and bridge over the rushing stream, we had to cut steps for ourselves on the steep sides of the ravine—an unpleasant task in the face of the cold wind. We reached Baltal without mishap to any of my party, but one of the Baltis who had joined our coolies was frozen to death while being carried across the pass.

At Baltal I expected to spend the night with less discomfort than I had experienced at Mechuhoi. The key of the apartment reserved for Europeans visiting the rest-house had been entrusted to a postal Daroga, or overseer of mail-runners, but he had unaccountably returned it to Kashmir. I had to rest in the large room in company with coolies, servants, mail-runners, Baltis, and a couple of Kaskmiris who had been sent from Srinagar with some luxuries for me. It was the 11th of December when I reached Srinagar, so altered in appearance that my own friends failed to recognise me. Thence I travelled to Rawal Pindi in a "tonga," or stage-cart, specially adapted for steep gradients and sharp curves, and from Rawal Pindi I travelled by rail to Umballa, where my regiment was quartered.

CHAPTER VII

Preparations at Srinagar—Start from Bandipoora—Trouble with Khalik—Trial of Khalik—Stay at Gilgit—Hunza—Mutinous pony men—Journey to the Pamirs—Frost-bitten—Difficulty of surveying in winter—Trouble with natives—Visit to Cobbold.

LIKE other British officers smitten with the exploration fever, I had had difficulty in obtaining sufficient leave of absence from my regiment, but in March, 1897, owing to troubles arising from an unhealthy liver, I found it necessary to resign my commission and quit India for good.

The immediate purpose of the first portion of this journey for which I now prepared, was the exploration and careful survey of that part of the valley of the Yarkand River extending from the west end of Raskam to the neighbourhood of Yarkand. The most recent map of this region with which I was provided was Lord Curzon's, published in the Geographical Journal for July, 1896. On this carefully compiled map, showing the Pamirs and adjacent country, a long stretch of the Yarkand River is represented by dotted lines whose general direction is about north-north-east, and I resolved to investigate what truth there was in this doubtful representation. Some Europeans had crossed the river at Langar, and Grombchefsky had crossed it at Sanglash, but no other traveller had followed its course below the west end of Raskam. For the purpose of this investiga-

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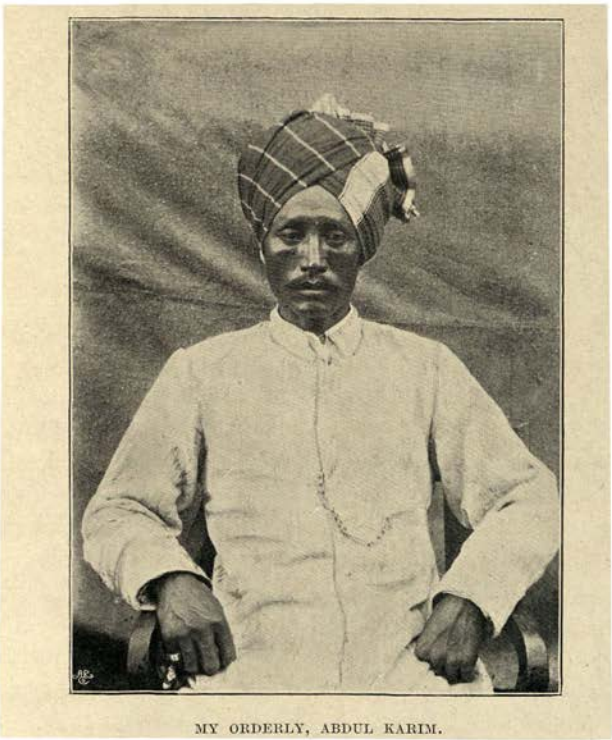
tion it was advisable to avoid, if possible, the long and circuitous route by Leh and Yarkand, and to proceed by the Gilgit-Hunza route to the Taghdumbash Pamir. Along this route the difficulties of transport and supplies were very considerable, and it was doubtful whether the necessary permission would be granted by the Indian Government. The authorities, however, not only acceded to my application, but also enjoined their officials to render me such assistance as might be within their power, so that I had the prospect of being able to commence survey work immediately after crossing the frontier, and of achieving my first purpose before any great fall of snow could retard operations.

For this, as for the earlier expedition, caravan preparations had to be made at Srinagar, but as it was my intention to winter in Turkestan and enter Tibet from the north in the following summer, the preliminary work was on a much smaller scale than in 1896.

Owing to the demand for troops for the Tirah Field Force then being mobilised, I was deprived of a companion who had intended joining the expedition, but, fortunately, R. P. Cobbold, late of the 60th Rifles, who was then in Srinagar, obtained leave and became my fellow-traveller as far as the Taghdumbash Pamir. The assistant-surveyor, formerly lent to me by the Indian Survey Department, had been murdered during an expedition undertaken by Pottinger, but a fresh man, Dalbir Rai, trained at Dehra Dun, was now supplied. As my connection with the army and the Government of India had ceased, I was at a loss for a young and trustworthy man to act as orderly. Many old pensioners from native regiments could easily have been procured, but youth was as essential as staunchness. While dining one night with the 3rd Madras Lancers at Secunderabad I happened to mention the matter, and the commanding officer, Major

Jones, said that he had in his regiment an excellent fellow who might volunteer. When I asked the youth whether he would join me, he replied at once, "I will go with you to Kabul, Lhasa, or Pekin," rendering further parley unnecessary. The man was named Naik Abdul Karim;



MY ORDERLY, ABDUL KARIM.

he was a Chinaman, a native of Yunnan, whence he had wandered through Lhasa and Nepal to India. The permission of the Military Department was obtained, and the orderly joined me at Srinagar a few days before I started. Other members of the party were Dass, the cook; Utam Singh, the collector; Abdul Khalik, the

caravan bashi; and five other Argûns, four of whom had accompanied me on the former journey.

Owing to the demand for transport animals for the Tirah Campaign, ponies or mules fit for my purpose were difficult to find in Srinagar. There was no scarcity of old and useless animals, for which the owners asked fancy prices, and scores of these had to be rejected before thirteen ponies of fair quality could be secured. On my behalf an arrangement was kindly made at Bandipur by Major Yeilding, the commissariat and transport officer on special duty in Kashmir, for twenty-five ponies for at least six months, from Shukur, a native of Astor. The average native of the East, however, does not hesitate to go back on his bargain if it seems convenient to do so, though he rightly considers such a proceeding disgraceful in a Sahib. Of the ponies supplied by Shukur none were of the prescribed standard and condition, and only a few were fit for a lengthened journey. For a time there was a difficulty in procuring pack saddles, which the caravan bashi asserted amounted almost to an impossibility, but eventually wooden ones were obtained from Dras.

Having seen Khalik and the ponies set out on the road to Bandipur, the starting-point for Gilgit, it was with great pleasure that on September 15th I left Srinagar, and floated down stream in a dunga, or native house-boat. Next morning, suffering from the stings of vicious mosquitoes, I reached Bandipur, where Khalik and the ponies were waiting, but the lazy bashi had done nothing towards having the new saddles fitted to the ponies, two of which had slight sores on the back, so that I had to ask Major Yeilding for a couple of substitutes. Profiting by experience acquired in my first journey, I determined not only to weigh every package, but to have the packages arranged in almost equal loads of about two maunds or 160 lbs. each. The caravan bashi is usually instructed to

make arrangements (bandarbast karna), and the result is rather a lessening of his own work than a satisfactory distribution of the packages. My proceedings now were contrary to custom, and Khalik, evidently resenting the innovation, became quite sulky. For the labour undergone by myself in this matter I was abundantly repaid during the journey. The work was properly done once for all, instead of having to be repeated in an unsatisfactory manner before every march, and the risks of loads slipping off was reduced to a minimum. Our thirty-three baggage animals on leaving Bandipur carried a total weight of nearly two and one-third tons, mostly of flour, rice, and corn, so that we expected to be nearly independent of local supplies till we reached Turkestan. After a busy morning I saw the last of the ponies loaded and on its way by half-past one; then I went to Major Yeilding's bungalow, a couple of miles from the village, and once more enjoyed the cheerful company of this hospitable family who had freely helped me in the all important matter of transport. Climbing a zigzag road from which excellent views of the picturesque valley beneath and the adjacent pine-clad mountains were obtained, I reached the small rest-house of Tragbal about eight o'clock in the evening, and found Cobbold waiting for my arrival. The cool, bracing air provided a delightful change from the hot, moist climate of Srinagar, while the scenery, enlivened by the wild flowers scattered about the Tragbal Pass, and by clear rivers flowing in the distance, made us more thoroughly enjoy this pleasant country.

It was not long before complaints were made to me against Khalik, the caravan bashi, who was alleged to have defrauded his namesake, Cobbold's factotum, of about forty rupees. Though Khalik had been recommended to me as an excellent man for supervising others, my own experience of him had led me to a different opinion, and

there seemed no room for doubt as to his dishonesty. However, as it would have been inconvenient to bring matters to a crisis while we were *en route* to Gilgit, I pretended to be ignorant of his misdeeds, even though Abdul Karim offered to enlighten me on the subject. Natives have generally a clearer insight into each other's characters than Europeans possess, and have generally better opportunities for arriving at a correct opinion. I, therefore, when on the march to Astor, took advantage of Abdul Karim's presence alone with me and spoke of Khalik's character.

"Well, Abdul Karim, what do you think of the caravan bashi?"

"Sahib, he is a very bad man and a great thief; kill him, Sahib, at once, and there will be no more trouble." Seeing that I did not at once concur, he added, "If you do not like to kill him, give me the order; I shall kill him at once, and then you will have no more trouble."

Abdul's method of dealing with the delinquent was more severe than any I had considered, and did not obtain my approval, but, as I did not wish to extinguish completely the zeal of my orderly, I only remarked that, as we were still on British territory, it would be better not to act on his advice just at present. Khalik was cordially hated as well as dreaded by several of his fellow-countrymen, who offered convincing evidence of his evil doings. He was apparently quite ignorant of the dislike with which he was regarded, and when we came to Dak Pari, the last rest-house on the way to Gilgit, he openly denounced and abused me in the presence of all my followers and the few Dak men, or mail-runners, who inhabited the place. He asserted that his Sahib was a miserable cur, who had himself meanly purchased the few ponies which belonged to his section of the caravan, and had even bought the

provisions for the journey. The point of the grievance was that the caravan bashi had been unable to make such illicit gains as he professed to have made when in the service of others, whom, according to his own shewing he had defrauded of forty or fifty rupees a day. Khalik's ways were now clearly intolerable, and a few hours after we had reached Gilgit, he was safely housed in gaol on a charge of robbery and fraud. This incident was in itself

ARREST OF ABDUL KHALIK.

exceedingly disagreeable, and it marred my enjoyment of the otherwise cheerful conditions of my stay at Gilgit. The Wazir, or native Governor, Mohammed Akbar Khan, was well acquainted with Khalik's antecedents, but nevertheless devoted the best part of three days in a painstaking and impartial investigation of the charges now brought against him. The result was the prisoner was convicted and condemned to twelve months' imprisonment with

hard labour, a sentence which was afterwards considerably mitigated. In the midst of unavailing protestations, Khalik was photographed with shackles on, and, in his bitter resentment, he vowed that I should receive the same measure as Dagleish, who had been murdered by Dad Mohammed near the Karakoram Pass.

At Dak Pari, Cobbold had suffered from an attack of blood poisoning and had been carried thence to Gilgit

MY PATHAN PONY MEN.

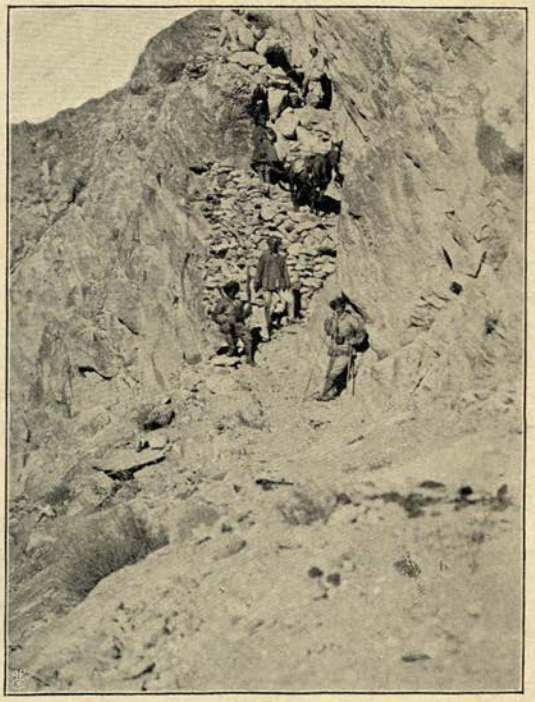
where we were hospitably received by the Political Agent, Captain A. H. MacMahon, C.S.I., C.I.E., and by Mrs. MacMahon, who had a most luxurious camp pitched for us in the delightfully cool shade of a large clump of trees a little below the Agency. The open-handed hospitality displayed was most generous in a country where everything but meat and milk has to be brought from India, on baggage animals during the few months in which the

passes are practicable. To supply the place of some useless ponies, we obtained at Gilgit ten fine mules and two ponies on a six months' agreement with Mohammed Amin, a wiry old Pathan, who proved as great an acquisition as his three fellow-countrymen, who did nearly all the heavy work of this section of the caravan. From Gilgit to Baltit, the capital of Hunza, and a picturesque village, we had the company of Captain MacMahon, and of Captain Roberts, the Agency Surgeon, who, having been present at the capture of Nilt, took us round the place and pointed out the objects of special interest.

At Baltit the Astor pony men who, a few weeks before, had clamoured for employment during the winter months, now became openly mutinous, and refused to proceed further on any conditions. The matter was reported to the Political Agent, and under the pressure which he could bring to bear the men yielded, but sulked and lied freely concerning me.

We were tempted to delay a few days, for the sake of Captain MacMahon's company as far as the Kilik Pass, whither he was going on a tour of inspection, but the season was now well advanced, and we deemed it advisable to set out at once so as to reach the Taghdumbash Pamir before the passes were encumbered with snow. A short distance beyond Baltit the track became narrower, and often so steep and stony as to be impracticable for laden ponies, so that it was necessary for a time to transfer all the baggage to the coolies. The journey to the Pamirs, however, was accomplished without any more serious mishap than the death of one pony, and the fall of another laden with flour, into a deep water hole with a soft, muddy bottom with which the driver also, in consideration of his neglect, was required to make acquaintance. The Astoris continued to be troublesome, and it was with great joy that we beheld the approach of several Kirghiz with

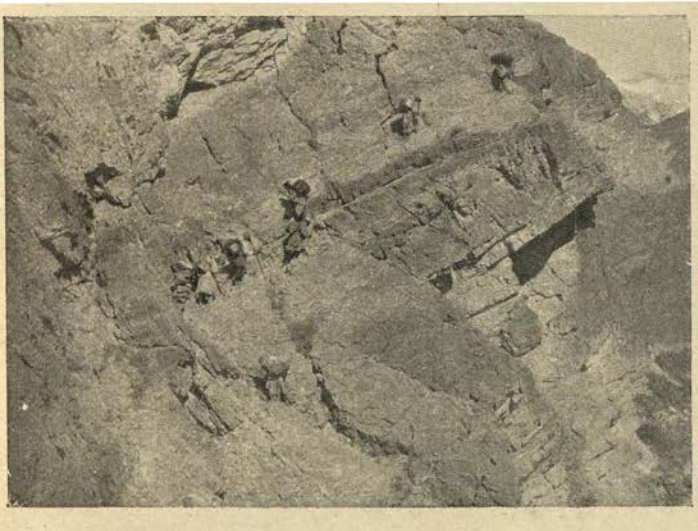
numerous yak and ponies for our baggage. I was now resolved to dispense with the services of the Astoris, and, knowing their contemptible character, I took the precaution of paying them in the presence of Mohammed Amin and his Pathans, as well as other witnesses, giving them, in addition, a small gratuity, providing them also



BAD TRACK IN HUNZA.

with the letter of discharge without which they could not proceed beyond Baltit, and making them the bearers of a letter to Captain MacMahon, in which it was stated that they had been paid off. Yet, on reaching Gilgit on their way home, they freely accused me of having sent them back unpaid.

Soon after reaching Shiran Maidan, the last halting-place on the south side of the Kilik Pass, we were agreeably surprised at meeting Isidore Morse, an American, who had left Ladak early in the summer in search of wild sheep (*ovis Poli*). His description of the excellent and varied big-game shooting in the Ili Rich district so excited Cobbold, that as soon as possible he applied for and obtained from M. Petrovsky, the Russian Consul-General



KANJUTS CARRYING BAGGAGE UP A PRECIPICE.

at Kashgar, the necessary permission to travel in that land of promise.

Very fortunately there was but little snow on the Kilik Pass, which we crossed on October 20th, and none in the Taghdumbash Pamir, where we pitched our first camp not far from the Kukteruk nullah at an altitude of 13,950 feet. So long a time had elapsed since our setting out from Gilgit that we could not place much reliance on

the longitude brought up by the chronometers, and I resolved to determine the longitude of Camp 1 by triangulation from some of the peaks fixed by the Pamir Boundary Commission.

For this purpose sites for hill stations had to be selected, but, owing to the severity of the weather, I was unable to reach the elevation I wished.

The day after we reached the Taghdumbash Pamir, Cobbold, who was not an enthusiast in the work of surveying, set off in search of the *ovis Poli*, which were plentiful in the Kukteruk nullah, but these animals were so uncommonly wary that I declined to waste much time in their pursuit, and moved towards Ujabadi, rejoining my companion on the route.

This was the more necessary as on the latest map of this part of the country our present locality was represented incorrectly, and it was indispensable for topographical work that we should have good values for the longitude of our encampment. The requisite operation is exceedingly simple in theory, but, owing in great measure to difficulties arising from the lateness of the season, I found it troublesome in practice. By the end of October, when work was well begun at Hill Station "A," 17,650 feet in height, near Mazar Sultan, there was too much snow and the wind was too strong and biting to permit the erection of the theodolite at the most suitable places. There was also very great difficulty in identifying the points which had to be observed. All of them had been fixed by Colonel Wahab from the west, from which quarter I had never seen them. I was doubtful of my longitude, and my perplexity was increased by the action of the wind, which altered the direction of the ruler on the plane table, aligning it now to one peak, now to another, each apparently as important as any of the others. In fact, to one looking westwards from Hill Station "A," near Mazar

Sultan, there seemed to be an archipelago of peaks, with one exception nearly all about the same height. As the day advanced the wind increased in strength, and, in order to get the observations at this exposed place completed as early in the morning as possible, I twice camped at an altitude of 14,930 feet in a small waterless valley, where there was sufficient snow to make tea with and just sufficient level ground for a small tent. Enveloped in huge fur coats, and with the extremities suitably protected from the cold, Dalbir Rai and I mounted a couple of yaks, the theodolite and heliograph being placed on the back of a third yak, and with two Kirghiz to urge forward the animals, we commenced the ascent an hour or so before daybreak. The mountain side was covered with shale and a thick layer of large loose stones of various dimensions, and so steep was it that we found the continual effort to avoid slipping backwards from the saddle exceedingly unpleasant. We therefore dismounted and continued the ascent on foot, considerably aided still by the yak, to whose tails we clung pertinaciously. The Kirghiz could not understand the craze which impelled me to climb mountains in winter (it was about the middle of November), and to remain on their summits for hours at a stretch looking through a telescope, but they did their work faithfully, and shewed fewer signs of resentment than did the yak, which now and then could only be urged on by blows. Unfortunately, though we were early at work, the strong wind was as early, and we found it very difficult to make observations. The observer was now and then blown against the theodolite, and the tail of his fur coat swept against the stand, and the alignment again and again disturbed. The altitude and the wind together made it difficult for Dalbir Rai to hear my shouting of the entries he should make in the angle book, and the work was delayed by the necessity of repeating the entries to

avoid mistakes. The work, however, was completed, heliographic signals from stations in the valley were observed, and replies were sent, the theodolite was packed up, the yaks loaded, and a large pillar was erected to mark the spot for observation from the lower stations; then we gladly returned to the camp in the valley.

The result, I may add, was very satisfactory, but it was accomplished at the cost of frostbitten fingers. The hill station was at an altitude of about 16,880 feet.

It was evident that the Kirghiz and Tajiks of Oprang, Ujadbai, and its vicinity were most unwilling that I should travel to that part of the valley of the Yarkand River known as Raskam, their allegation being that the roads had been rendered impassable by earthquakes a few years before, and that no one ever used them now. After a short time, a Tajik was found who undertook to accompany Changfûnchuk, one of my men, whom I detailed to inspect the route as far as the Yarkand River and return to Mazar Sultan with his report. While this investigation was being carried out, I set about the removal of my camp to Oprang, at the junction of the river and the valley which descends from the Oprang Pass. Cobbold had gone to that neighbourhood in quest of shikar, but, in his directions for my guidance, he had underestimated the distance from Mazar Sultan. In the forenoon I despatched the few men and baggage animals required at the new camp, but, with Dalbir Rai, remained behind till nearly four o'clock to complete the triangulation. The man in charge of the pony carrying the theodolite, preferred to go back to a ford which he knew near Mazar Sultan, rather than trust to the discovery of one higher up the stream, while Dalbir and I were taken by a guide along a more direct route. At the ford the river had been partially dammed by ice which was not strong enough to bear the weight of a mounted man.

The guide, going on in front, made his pony smash through the ice, and thus prepared an easier passage for me. Dalbir Rai's pony, however, being allowed to take his own course, mounted on the ice which broke up into large patches, swaying under their load like planks in a rough sea. Dalbir Rai seemed a tender, sensitive man who had not sufficient strength of will for the guidance even of a pony. When I remonstrated with him for not taking the prepared course, he thought it a sufficient reply that the pony wished to go another way, and he evidently felt aggrieved at my remarks. I did not reach Oprang till about half-past eight in the evening; but two of the men, over-confident in their ability to find the route, were quite belated, one of them having to spend the night in the open air, while the other was sheltered by some Kirghiz.

A few days were devoted to sport in the neighbourhood of the Kungerab Pass, where shikar were plentiful, and, in the meantime, Islam, a Ladaki, was sent to reconnoitre the route *viâ* the Oprang Pass to Raskam. There had again been difficulty in finding a man to accompany the Ladaki, the stereotyped reason, that the route had been destroyed by earthquakes, being strengthened by the rumour that neither grass nor fuel could be found there. The opposition of the Tajiks made me the more determined to go to the west end of Raskam, and eventually a native was found to accompany Islam. The efforts of this guide seemed less directed to finding whether the route was open than to proving that it was not; but Islam remained faithful, and at length brought back the welcome news that the route was perfectly easy, with plenty of grass and fuel as far as Issok Bulok (Hot Springs), the furthest point he had been required to reach.

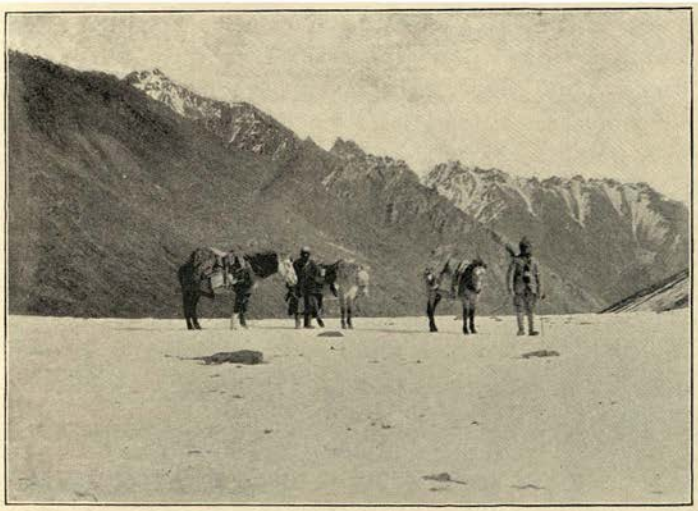
CHAPTER VIII

Earthquakes—Raskam—Fording Yarkand River—Bazar Dara—Approach to Kukalung Pass—Zad—Recrossing Kukalung Pass—Camp at 16,000 feet—Incorrect maps—Description of country—Illness of Dalbir Rai—Approach to Sandal Dawan—Bivouacking on mountain-side—Dysentery—Easy marches—Arrival at Yarkand.

BY this time, however, Changfûnchuk had reported that the Ilisu route, though beset with greater difficulties than that by Issok Bulok, was quite practicable. Consequently I had a choice of routes, and a comparison of their respective advantages led me to choose that which Changfûnchuk had investigated. Its merit was that it led to the west end of Raskam, and would save two days' march as compared with the Issok Bulok route. The Tajiks, perceiving that I was not to be deterred by false reports, began to yield, and, while alleging dread of earthquakes, supplied me with transport but no guides.*

* Public orders had been issued by the Taotai at Kashgar not only that no opposition was to be offered to me on my journey, but that every assistance was to be rendered to enable me to travel wherever I wished. But it was subsequently ascertained that, secret orders had been given to the Chow-Kuan at Tashkurghan cancelling the public orders, and enjoining that I should be dissuaded by reports of roads blocked by landslips caused by earthquakes, but that, if I proved obstinate and resolved to proceed to Raskam, transport might be supplied, but no guides on any account.

It curiously happened that at Ilisu two shocks of earthquake occurred on the night of November 19th, and one on the following morning. Very soon after the first two were felt, a large deputation of Tajiks, with their headmen, came to my tent and, greeting me with the expected "we told you so," &c., begged me to desist from a journey which was sure to end in disaster. When they had finished their entreaties, I complained of the annoyance



TOP OF THE ILISU PASS.

they caused by their wanton interruption of my night's rest, requesting them to leave me in peace and assuring them that I should travel to the Yarkand River by the route that I had chosen. The men, evidently much surprised at the nature of my reply, left me to enjoy my slumbers.

The ascent to the Ilisu or Ilighsu Pass from the Taghdumbash Pamir is exceedingly stony, and, near the summit, very steep, though the descent into the Talde

Kol Su valley proved comparatively easy. It was in this valley that I first became acquainted with the distinctive features of the region. Bold, rugged mountains, absolutely barren and, as a rule, so precipitous as to be within very few degrees of the vertical, towered above us on either side to a considerable height. The winter sun in many places could scarcely reach the bottom of the valley, and, where it did, it was only for a little while. At such spots we turned the animals loose (as at Ilak Wydi) that they might search for food. The grass at Gezuk was short, here it was long and coarse of the sort called kamish, but so dry as to be of little value. The lower portion of the valley was choked up with jungle, and in many places there was ice which had to be roughened or overspread with earth to be rendered passable for the baggage animals. From the gorge which forms the mouth of this valley we entered the Raskam valley which, only a few years before, owing to the depredations of the Kanjuts, was forbidden ground to British travellers. I believe that Messrs. Church and Phelps were the only British travellers who had ever passed through the valley, and the fact that this was, in a manner, virgin soil, rendered this portion of my journey the more interesting.

From the opposite bank of the Yarkand or Raskam Daria, as the river is called at Sarok Kamish, there is a well-marked trail leading up to Topa Dawan, and thence by a series of exceedingly steep zigzags into a very narrow and deep valley in which there is plenty of jungle. It was in this direction that I was most anxious to proceed, but the route had to be abandoned, as the men with the hired transport not only denied all knowledge of it, but flatly refused to accompany me in any other direction than that to Bazar Dara. At the east end of Sarok Kamish, the mountains on the left bank of the Yarkand River were so steep as to be quite inaccessible

to one burdened with a large theodolite, and I had to content myself with those on the right bank which, though not so steep, were too low to afford a view of the peaks fixed from the neighbourhood of Mazar Sultan.

The tract known as Raskam, is that portion of the

SCENE IN VALLEY OF THE TALDE KOL SU.

valley of the Yarkand River stretching from Bazar Dara, a small fort at the mouth of the Dozak Dara Su, westwards to the point where the river turns sharply to the north. The uninhabited valley is bounded by steep and lofty mountains, utterly barren, and with the exception of the Miskan Jilga, a small valley to the north of Topa Dawan,

where there is a little cultivation, and a few spots of which Azgar and Kuktash are the more important, the whole valley is unfit for cultivation. A few hundred yards east of Azgar the valley is very narrow, but opens out a little near Surukwat, or Karaul, where there are small trees and a patch of good short grass. This spot, situated in a semicircular depression between the river and a series of cliffs almost all vertical, forms a convenient camping ground. A short distance beyond, the valley again resumes its gorge-like aspect. By far the widest portion of Raskam is at Chiung Jangle (Large Jungle), where the bottom of the valley contains low dense jungle but little grass.

The Mir of Hunza and the Kanjuts, as I was informed before leaving the Taghdumbash Pamir, laid claim to Raskam, with what justice I cannot say. The eagerness of the Kanjuts to be allowed to return to this barren land, and to resume the cultivation of its few cultivable patches was very remarkable. They believed that by means of irrigation fair crops could be raised, but when one thinks of the long distance from Hunza to Raskam, of the absence of facilities for communication, the miserable foot tracks, and the wide and rapid rivers to be crossed, it is only fair to assume that these brave and hardy men were influenced by a strong attachment to their ancient home.

The march from Surukwat to Bazar Dara, though only about ten miles, took a long time to accomplish owing to the necessity of fording the river repeatedly. The depth of the water, the strength of the current, and the stony nature of the bottom made it difficult for the mules and ponies to keep their footing. On December 5, 1897, there was a margin of very thick and slippery ice extending for some yards from each bank. The man who, for the time, was acting as guide, and whose duty

it was to find where the river could be most conveniently forded, had a pony which was quite accustomed to the ice. The guide thought nothing of the difficulties of those who were less satisfactorily mounted, but boldly crossed the river wherever he chanced to meet it. The pony, freed from the rider's weight, kept his feet on the ice at the near side of the river; then he carried his master across the channel where there was no ice, gave him a lift on to the ice at the further side, and scrambling up without much difficulty reached *terra firma* beyond. This procedure may have been admirable in itself, but it was not what was required in the leader of a mixed company like ours, and our inconsiderate guide was deposed, Raju, the caravan bashi, and I undertaking the work. With long sticks we ascertained the depth of the channel and the nature of its bed. When the place seemed suitable, we requisitioned the services of the *quondam* guide in clearing away the ice with a pick-axe from the bank to the open channel of the stream. Then we despatched two men on horseback to the further bank and there a similar operation was carried out, the ponies having been sent back for further loads, half-frozen, with their tails decked with long icicles that jingled and rattled at every movement. The yaks, too, after crossing, sparkled with the countless icicles which hung from their long hair and tails, but these animals, unlike the ponies, seemed indifferent to the cold.

Quite close to Iryar in this valley, the route was very difficult. The track was narrow, along the edge of steep cliffs, and one of the ponies, having lost its footing, fell to the rocks below, where it must have met instantaneous death. Among the packages with which the animal was laden, were a bag of flour encased in a waterproof covering which was but little injured, a bag of corn which was quite torn up, and a box containing, in

addition to 100 rupees in small change, a number of tins of matches. The matches were ignited by the concussion, but the tins containing them were so strong and so firmly soldered that none of them burst, though they were bulged out like balloons.

From Sarok Kamish I had sent forward a messenger to Bazar Dara on a baggage pony, to announce my visit to the commandant of the garrison, and when approaching the fort along with Raju, the caravan bashi, we went on ahead on foot to look for the best course for the caravan to follow. As we advanced we overtook the pony of the messenger which had been left to graze by the side of the track, and I was about to mount when Raju seriously remonstrated with me against such an unseemly proceeding. As the pony had only some rags for a saddle, and a piece of rope for a bridle, it seemed to Raju beneath my dignity and the dignity of the occasion, that I should enter a Chinese stronghold with no more sumptuous equipment. The earnest manner in which he protested and urged me to wait for my proper pony was very amusing, and, to his keen satisfaction, I acquiesced, so that when, soon afterwards, some of the garrison of the small walled enclosure, which the Chinese call a fort, rounded the corner and salaamed to me, I was able to respond to their greeting with becoming state. The love of outward show seems supplied in excess by Nature to the Oriental mind.

The garrison at this place nominally consists of twenty Kirghiz: and the Beg of Zad, in whose district it stands, receives pay and food for the support of that number; but, in accordance with the usual methods of Chinese officials, this functionary pockets most of the pay and maintains only a few unarmed men. In most countries flags are not regarded as part of the soldier's armament, but here there appeared to be no military equipment

whatever, except the large yellow flag which was hoisted daily during the few days of my visit, so that this Celestial fort may fitly be described as armed with a flag.

The valley at the mouth of which Bazar Dara is situated, well deserves the name of Dozok Dara (Difficult Valley), for it is stony and barren. The pass at its head, the Kukalung Pass, though 16,000 feet high, is not difficult when free from ice, but as we approached it we found the valley in some places not more than twenty-five feet wide, and encumbered with slippery and sloping ice. Here the animals fared very badly, especially the mules, which quite belied their reputation for sure-footedness, slipping and falling far oftener than any of the ponies. At Tapin Chat (14,300 feet) we halted for the night before crossing the pass, but there the altitude, the cold wind, and the absence of vegetation made the conditions too trying for the baggage animals. Hastening forward we reached Zad, the largest permanent encampment of Kirghiz in the Kulan Urgi valley, where we remained a few days, and then, having obtained some fresh yak, we set out to recross the pass, in order to connect the triangulation with that from Bazar Dara. Most of the men and all the mules and ponies were left at Zad to recuperate, while Dalbir Rai and I, with Dass the cook, and Changfûnchuk who acted as interpreter, along with two Kirghiz who looked after three yak, re-ascended the slope towards the pass. The yak could endure the strain; they are patient, plodding animals, not sensitive to cold, and, being ruminant, can without difficulty be without food for a few days.

The work of a surveyor at an altitude of 14,700 feet is not in itself attractive. It requires some resolution, when the thermometer is below zero F., to bear exposure during the greater part of the day to a strong freezing wind,

while on the moustache and beard icicles form, which can only be got rid of by melting before a smoky fire of dung. The work at Tapin Chat was undoubtedly trying, but that at the pass itself, from 16,000 to 17,000 feet in height, was much more so. On Christmas Day, 1897, we began early, and, after measuring a base with the subtense bar, entered on a difficult ascent towards a commanding spot where Changfûnchuk had already erected a pillar. The steep slope was slippery with fresh-fallen snow, and by the time we had reached the pillar and had fixed the theodolite in position, a strong wind had arisen which, with the temperature several degrees below zero, made observations difficult. A sudden gust would impel me against the eye-piece, or blow my coat-tail against the stand of the theodolite, and, unless I used a piece of paper or cardboard to screen my face from the instrument when reading the vernier, my beard or moustache invariably got frozen to the metal. Such matters seem trifling, but attention to them rendered the work slow, while neglect of them retarded it still more. When we had completed these observations, we found it more difficult to descend from this hill station than it had been to reach it. We tried a more direct line, but the slope was too steep. There was serious risk of falling down the mountain-side or of spraining the ankle by treading on the treacherous pieces of shale, and it was necessary to wait till the trusty yaks, managed by one of the sure-footed Kirghiz, had made a series of footholds for our descent.

At the pass there was no fuel to be found. We had brought two sacks of dung and boortza from Tapin Chat, and this sufficed to make hot tea in the morning and to cook our dinner. But the supply we had ordered Mohammed Amin's men to bring did not arrive, and our operations at the pass were therefore shortened. As soon

as we had finished the work on hand and had placed the instruments securely on the yak, I set out on foot and reached camp in the Kulan Urgi valley about ten o'clock in the evening. Dalbir Rai preferred to ride, and was much later. The exposure and privation had been too much for Dalbir Rai, and he became feverish and very unwell. For a time I was deprived of his assistance, and in fact he never did recover from the hardships of those days. In this (the third) crossing of the Kukalung Pass, the tube of the full length mercurial barometer was broken, but I had a spare one in which a few air bubbles had found entrance into the column of mercury. These could not be got rid of by shaking and tapping, but I was able to dispel them by carefully heating the tube over the camp fire.

As I became better acquainted with this region, my faith in the only map I had became weaker, and when I reached Issok Bulok Agzi in latitude 37° N. and found that I was still two days' march from the Yarkand River, my confidence in the map quite vanished.

In the neighbourhood of Fortash, I made unsuccessful efforts to find an accessible peak whence I might obtain a commanding view of the country we were about to traverse. We discovered an eminence which seemed suitable for a hill station, and one of the men whom I had trained to the work, laboured at the erection of a pillar of stones, but the task was found to be impracticable. Returning to Issok Bulok Agzi, I began to take observations of moon culminating stars for longitude, but this work was stopped by bad weather, and, as the season of heavy snowfalls was about to commence, the only course open to me was to set out for the plains of Turkestan as speedily as possible.

From Issok Bulok Agzi to Tir, the largest village in the Kulan Urgi valley, and about five miles from its

junction with the valley of the Yarkand, the route lay along the bottom of the valley. Mountains, utterly barren and too precipitous to be climbed, except at one place near Yagzi, rose to a great height on either side. At some places the river was frozen over and we could cross on the ice, but between Issok Bulok Agzi and Yagzi, the current was so rapid that the stream was only partially bridged in this fashion. From a point a little above Yagzi down to the Yarkand River, there are numerous patches of cultivation with apricot trees scattered about. In fact, wherever cultivation is possible it is carried on.

There were two direct routes from Tir to Yarkand, one over the Karamut Dawan, which was said to be execrable owing to the steepness of the rocky sides of the valley; the other by Sandal Dawan, which, in accordance with the advice of the Yuz Bashi (Head of a Hundred Men) of Tir, I resolved to follow. The only difficulty of which I was told in this route, was a slide of bare rock where animals had to be unloaded and hauled up. This obstacle we reached early in the day, and being supplied with a party of villagers for haulage, we set vigorously to work. The task was laborious and tedious, some of the animals were hurt in their struggles, and it was not till dark that we succeeded in reaching a fairly open space, some few hundred yards above. This was a cheerless spot, called Keshna, at an altitude of 10,000 feet, where we found little grass for the animals, but a sufficiency of fuel and water. The Yuz Bashi having assured us that there was no other serious obstacle on the route, he and his men went back to their homes. Their representations proved much fairer than the truth, for, when we had gone halfway from Keshna to the top of the Sandal Dawan, which is 16,000 feet high, we came upon so steep a slope that the animals had to be unloaded and the baggage carried up by the men. We had here few hands to do the work, and

the process was lengthy; but with this exception the track to the summit, though steep, was on the whole not bad. It faced southwards, and was free from snow. Looking from the summit northwards, we found a perilous descent before us. The slope was steep and covered

HAULING YAKS UP A PRECIPICE NEAR THE SANDAL DAWAN.

with snow, so that both men and animals had many a tumble. We hoped that things would improve when we reached lower ground, but there we had to reckon with very slippery, sloping ice, on which the animals fell and slid for yards together. By scattering earth over the ice we were able by dusk, with the foremost part of the

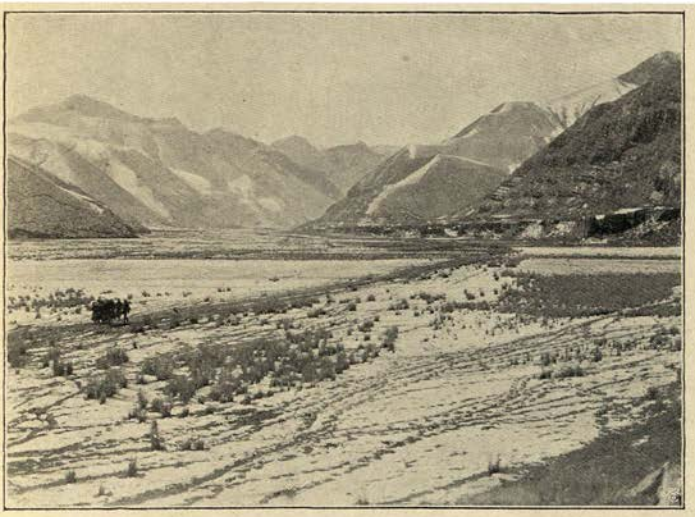
caravan, to reach a grassy slope, where we found a small excavation used by shepherds in summer. Here Dass lighted a fire of yak dung, and about nine o'clock Mohammed Amin, the old Pathan, arrived with his party, very tired and without baggage, all of which had been left some little distance behind. It is worth mentioning that the full-length mercurial barometer and spare tubes filled with mercury survived this day's journey.

Early next morning several villagers from the Asgan Sal valley came hurriedly to our bivouac (Camp 31), anxious to know why I had not reached them in the evening. Being satisfied on this point, they asked why I had chosen the more difficult and longer route, in preference to that over the Karamut Dawan. When they had heard my explanation they gave free and emphatic expression to their opinion of the conduct of the Yuz Bashi of Tir, but that official was now beyond our reach, and I could only report his behaviour to the Chow-Kuan on arriving at Yarkand.

For a few days Dalbir Rai's illness was a puzzle to me, but when we reached Zumchi he was plainly suffering from dysentery. He had, as I learned, disregarded my strict orders to abstain from solid food while his temperature was above normal, and had gorged himself with ghee and whatever else he could lay hands on. It was not easy to make an effective or lasting impression on this patient, but I tried and had some success. When he was suffering the pangs of sickness I cheered him up with the prospect of a speedy release, indicating that there was no hope of recovery except by strict self-restraint. My harangue had a good effect, and he promised not to swallow a mouthful of solid food. It was necessary to have him fed on milk and properly cared for in his weakness, and I had to devise the means of his removal to a place of safety. No stretcher could be procured,

so I had him carried on my bed down the Asgan Sal valley, fortunately over good tracks, to Yarkand.

Ever since leaving Hunza, about the middle of October, we had traversed desert places, suffering privation and hardship. Now we were in a habitable country, where supplies were easily obtained. From Zumchi to Yarkand the whole country (with exception of but a few miles) is cultivated and fairly populous, but the breadth of the



GENERAL VIEW OF THE ASGAN SAL VALLEY.

cultivated area is restricted by the necessity for irrigation. Where this fails the country is a desert of loess, with sand here and there. The loess evidently reaches to a great depth, and at Tar Agzi its stratified formation, seen from a distance, resembles rocks. In contrast with the mournful wastes on either side, the Asgan Sal valley, with its cultivated land and its fruit trees, mostly apricots—and, at Oyung, pears too—seems a paradise.

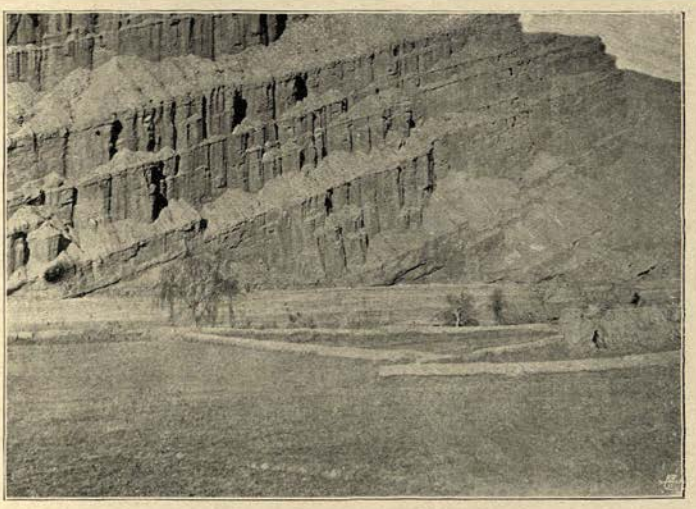
From Chumdi I despatched Raju, the caravan bashi, to Yarkand, to give the Chow-Kuan definite information as to the date of my arrival at that town. In Chinese Turkestan (or Sin-Chiang) the European traveller should, for his own sake, inform the authorities beforehand concerning his movements. In that country, which is regarded as the Siberia of China, good rest-houses are not numerous, and are not habitually kept clean and habitable. If the traveller neglects to inform the head officials of his approach, he will probably find no decent lodging ready to receive him, and no supplies for his caravan.

Trustworthy estimates of distance were important, and I was exercised in discovering the significance of native methods of indicating distance. Words were vague, and were seldom used for this purpose. The tone of the voice, a shake of the head, a movement of the hand or arm were deemed sufficient to enlighten the traveller both as to direction and distance. A little practice enabled me to attach a meaning, more or less definite, to each gesture, but the matter was often complicated by the manifest inaccuracy of the estimate which was offered.

At a distance of a few miles from Yarkand, I met the postman who goes twice a month to Kashgar and back, carrying letters of Indian traders, which pass by the Taghdumbash Pamir and Gilgit. A little nearer the town, the chief interpreter of the Chow-Kuan, accompanied by the Beg in whose district I was to stay, presented his chief's red card and the usual civil messages. Further on, Mr. M. Backländ, a Swedish missionary stationed at Yarkand, met me, and thus, pleasantly escorted, I passed through the outskirts of the Yangi Shahr to the quarters prepared for me. I found my place of rest outside the old town, in a good-sized fruit garden known as Kolkachi. The house was

decidedly airy, and altogether would form an agreeable summer residence; but on that day, January 20, 1898, I would have preferred a less draughty abode. However, the place was preferable to the noisy and dirty serais inside the town, and my landlord supplied abundance of forage for the animals, thus lightening the labours of the caravan men, who well deserved a rest.

My rooms had been nicely carpeted through the kind-



PECULIAR GEOLOGICAL FORMATION IN THE ASGAN SAL VALLEY.

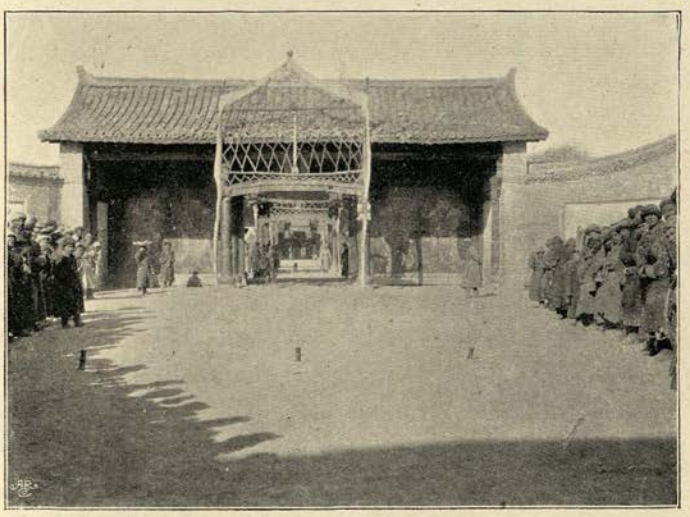
ness of Munshi Bunyard Ali, who ushered me into them with as much state as if I had been a personage of vast importance. These courtesies I accepted with all the dignity at my command, for, as my caravan bashi had shown me, it is inexpedient to belittle oneself in the East. Submitting to the inevitable, I conversed with the Munshi until, long after dark, the baggage animals arrived.

CHAPTER IX

Reception at Yarkand—Dining with the Amban—After effects—Swedish missionaries—Another attempt at exploration in winter—Route followed—Foiled by snowstorm—Recrossing the Yarkand River—Punishment of dishonest natives—Incapacitated by illness—Kosarab—Return to Yarkand—Meeting Macartney and Father Hendriks—Stay in Yarkand—Apology of Teetai—Observing in Yangi Shahr—Ignorance of Chinese officials—Islam Akun—Preparations for excursion to the Takla Makan—Discovery about "ancient" Khotan MSS.—Suspicions about Islam Akun.

THE greater part of my first day at Yarkand was devoted to a visit to the Chow-Kuan, commonly called the Amban, the chief Chinese official. Here, as elsewhere within the Celestial Empire, strict ceremonial politeness is expected even at the hands of strangers. It is necessary to give notice of an intended visit, and to mention the hour at which it is intended to pay it. If the day is unlucky, *e.g.*, a day of mourning for a deceased emperor, then the Yamen is closed to visitors till the afternoon. Such days are fairly numerous, and as they come round they are denoted by the words Chi Shen ("Bad omen day") written on a yellow cloth spread on a table at the entrance. I recognised that, so far as they concerned myself, the Chinese requirements were not unreasonable, for I was provided with officials ready to assist me. One of these I sent to make the announcement of my visit in the proper manner. Taking my visiting card, a piece of

bright red paper 9 inches long and 4½ inches wide, he went to the Yamen and, sending in my name to the Chow-Kuan, intimated the hour of the intended visit. The Chow-Kuan, with the civility usual in such circumstances, replied that he would be pleased to receive me at the appointed hour. The question of dress is of course important, and a European traveller does well to provide himself beforehand with raiment suitable for such occa-



ENTRANCE TO THE YAMEN AT YARKAND.

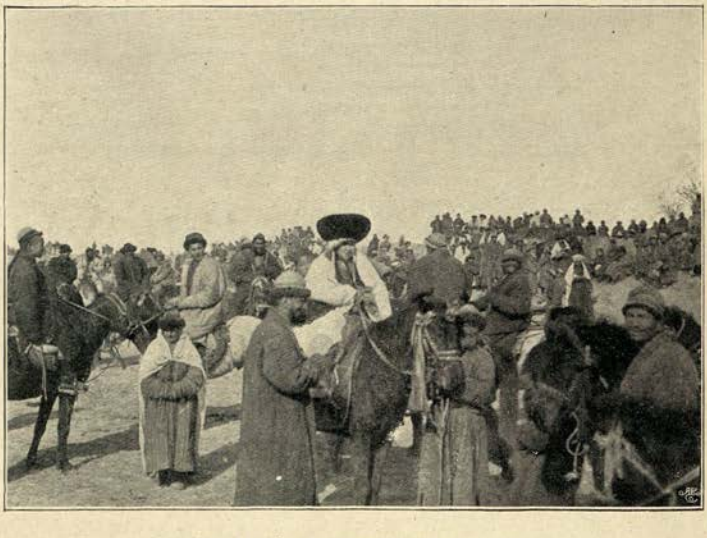
sions. Chinese officials do not undergo the hardships of explorers, and can make no allowance for a guest with travel-stained clothing. If one intends to appear in uniform, he is expected to give due notice, that his host may be correspondingly arrayed. I had now no right to wear uniform, but put on the brightest garments I possessed—a smoking jacket, knickerbockers, leggings, brown boots, and a terai hat with scarlet puggaree.

Escorted by the Beg in whose district I lodged and by Munshi Bunyard Ali, and attended by my orderly, Abdul Karim, and my caravan bashi, Raju, I proceeded on horseback to the Yamen in the middle of the Yangi Shahr. In the outer courtyard were several tiny guns, not more than a foot long, fastened to pieces of wood a little above the level of the ground. With these a salute was fired in my honour, much to the alarm of my pony, which was further perturbed by the crowd of loafers that rushed in from the bazaar to see what was going on. I dismounted at the entrance to the inner courtyard, where the main doors were opened for my reception, the side doors being used by the rest of the company. On entering I was met by the Chow-Kuan, a courteous elderly man, who shook hands with me and escorted me to the reception room on the east side of the building. We advanced to the end of the room, and there, with due formality, the inevitable cup of tea was at once presented to me by my host, who raised it to his head and then placed it on the small low table between our seats. I had been impressed, not unfavourably, by the external appearance of the Yamen, with its gaudily-painted arches, and was a little disappointed with this small, badly lighted, dingy apartment where, at the opposite end, a company of ragged and unwashed underlings were permitted to remain. The Chow-Kuan and I conversed in a leisurely way through the medium of two interpreters, and I had ample time to study the faces of the company. I munched the sweetmeats with which my host with his own hands supplied me, and observed that the nails of his fingers projected about half an inch. I mentioned my grievance against the Yuz Bashi of Tir, who had given me false information concerning the Sandal Dawan route, and the Chow-Kuan blandly promised that he should be punished. The interview was lengthy and tedious, and I felt relieved when

the time came for departure. As I left the Yamen the popguns again sounded, and I proceeded at a quiet pace through the bazaar towards my quarters. I had not gone far when the news reached me that the Chow-Kuan was already half way thither on the return visit. Setting off at a gallop, I reached Kolkachi in time to welcome my former host. He came in a two-wheeled cart, or marpa, drawn by a very fine mule, and he was provided with a numerous retinue of tag-rag and bobtail. Some of his attendants carried placards, one an umbrella, another a gong to give notice of the approach of this distinguished magistrate. With his consent I took several photographs of him, but as all my photographs were developed by Messrs. Law Brothers, at Umballa, I could only promise him a print in the distant future, a promise which scarcely satisfied him. On the whole, the Chow-Kuan was considerate, and his visit was of short duration.

Yarkand has often been described, and I need not repeat details with which readers of books of travel in Asia are familiar. The dirty, gloomy bazaar, with its tumble-down appearance, cannot be called pleasant, but it is certainly picturesque. The most frequented streets, however, and the most interesting, are very narrow and far too dark for the purposes of an amateur photographer. On the first day of the Chinese new year (held as a gala day) there was a remarkable display, intended as a military parade, outside the Yangi Shahr. The company of men claiming to be soldiers was no better than a rabble, though provided with a plentiful supply of large flags and a fair number of antiquated muzzle-loading firearms with very bad black powder. In the evening the Chow-Kuan gave a dinner at which I was the honoured guest. The repast was served at a large round table under the portico of the inner courtyard, in order that the guests might witness a strange, dreary performance in which the

Dragon was a prominent figure. The representation was varied in an erratic sort of way by squibs, but, for me, it was wholly uninteresting. Not having expected an open-air feast in the depth of winter, I had left my fur coat behind, and sat shivering in my smoking-jacket, while the wearisome repast went on. Anxious not to offend the Chinese by any appearance of indifference, I had posted Raju behind the Chow-Kuan at the opposite side of



NEW YEAR'S FESTIVITIES AT YARKAND.

the table, whence he could signal to me as occasion might require. The dishes, as they were served one after another, seemed interminable. There were more than thirty in all, some of them very good (for example, stewed duck and pastry), but others were bad and even repulsive. The viands had to be washed down with vile-smelling raw spirits of local manufacture, served in small cups almost saucer-shaped. Several times I tried to evade the refresh-

ments both solid and fluid on the plea of ill-health, but in each case I was constrained to comply with native custom. Some of the usages at table were, to say the least, disagreeable to think of. If a guest had not emptied his cup when the time came for replenishing it, its contents (whatever might have been left) were poured back into the spirit kettle, and then it was refilled. The guests were not supplied with separate table napkins, but were not left absolutely unprovided for with respect to such comforts. An attendant handed round to them successively, in due rotation, a greasy, steaming cloth, wherewith each wiped his hands and mouth. When my turn came I made a strenuous effort to decline its use, but a look of calm surprise from the Chow-Kuan, backed by a severe frown from Raju, quite cowed me, and I meekly wiped my hands and mouth with the disgusting rag, even as the others had done. It was not till late that I was able to take leave of my host, who sent lantern bearers to light me to my quarters. Having gone straight to the medicine chest, I swallowed the most potent correctives I could lay hands on, but from the effects of that huge repast, eaten when I was shivering with cold, my general health suffered severely.

I remained in Yarkand for about three weeks that both men and animals might enjoy the repose which they had fairly earned. During that time I had the pleasure of seeing Mr. Backländ, of the Swedish Mission, almost daily, and, as we walked or rode together, sometimes in the bazaar but oftener in the country, he gave me much information about the ways of the Chinese and the natives.

Being most anxious to make a third attempt to explore the unknown parts of Sarikol before the ice disappeared from the Yarkand River, I went to the Chow-Kuan to explain my purpose, as far as it had a definite form, and

to obtain from him the promise of assistance. The Yuz Bashi of Tir had been brought from his village and, when I went to the Yamen, I found him waiting to have his case disposed of. The Chow-Kuan investigated the matter, and it seemed clear that the man was to blame. He was sentenced to be beaten and, that he might not be subjected to torture, I asked and obtained permission to be present when the punishment was inflicted. Some of the officials

BEATING THE YUZ BASHI OF TIR.

of the Yamen asked me to deal with the prisoner myself, but this I declined to do. The prisoner was placed on the stone floor in front of the judgment seat, and held face downwards by two or three men while another beat him on the leg between the knee and the buttock. The short, rapid strokes of the thick stick seemed at first to cause little pain, but in a short time the skin became discoloured and, at my intervention, the beating was discontinued.

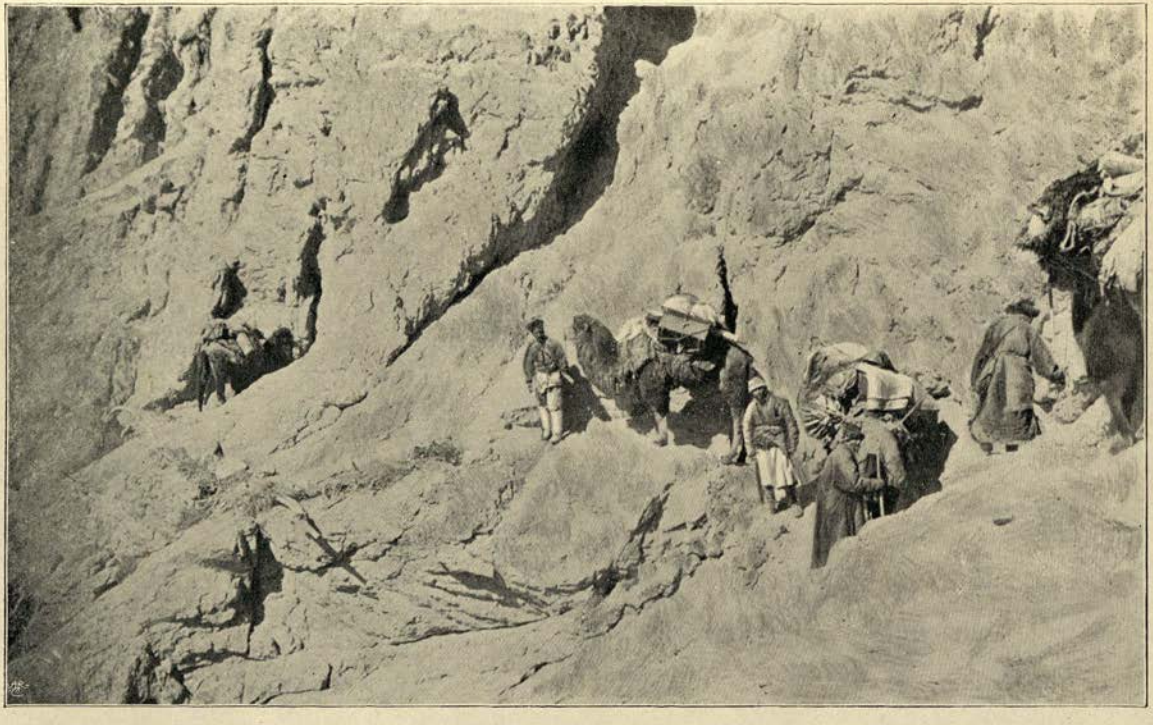
The Chow-Kuan not only sought in this manner to redress past wrongs, but gave orders to an official to accompany me when I set out, so that there might be no difficulty as to accommodation and supplies. It was impossible to obtain any information in Yarkand regarding the portion of the river valley between the west end of Raskam and Kosarab, and when I set out, it was with the intention of attempting to ascend the valley from Kosarab.

CROSSING THE FROZEN YARKAND RIVER.

There, however, the river was without ice, and I had to change my plan. Proceeding to Langar, a small village which before my visit had seldom seen a European, I found the ice still strong enough to bear the caravan in crossing the stream. As we advanced, snow began to fall, and, by the time we reached Rahbut, it was falling so heavily that the natives who accompanied me refused to go further. It was, at the time, very annoying to be

compelled to abandon the attempt to cross the difficult Khandar Pass, but on the whole it proved fortunate. In consequence of the open-air dinner on the Chinese new year's day I was in an unsatisfactory condition, and was forced to restrict my diet to milk or soup, the former being sometimes beyond my power of retention. Weak as I was, Dalbir Rai was much more helpless, suffering from rheumatism and fever, so that, even if we had reached the west side of Khandar Pass, neither of us would have been physically capable of survey work.

The ice was now melting fast, and when, on February 19th, we returned to Langar, the river was almost clear. The water was so deep that camels had to be employed to carry the baggage across, while the ponies swam. This retrograde movement was disappointing to me, and must have been more so to the Oan Bashi (Head of Ten Men) at Tung Langar. This petty official had procured supplies for me and had been duly paid before I left the village, but had not disbursed the money to those who had actually provided the various articles. News of his delinquencies reached me on my return, when I considered it right and proper, in my own interest and in that of the defrauded villagers, to see justice done. The Oan Bashi, on being arrested, admitted the charge against him, and there was no difficulty in making him disgorge. But restitution was not enough, and, as the Beg of Sarikol, the only magistrate who was capable of dealing with the case, was then at Tashkurghan, some method of having the matter at once disposed of had to be devised. In the East, speedy justice, even though rough, is more effective than long-delayed retribution, and I determined for once to take the administration of the law into my hands. I inquired of several villagers if they were aware of the prisoner's guilt, and knew what punishment he would receive from the Chow-Kuan at Yarkand if the



A NASTY CORNER FOR CAMELS.

matter were reported to him. They told me he was certainly guilty and would be severely beaten if reported to the Chow-Kuan, whereupon I ordered Raju and Abdul Karim to hold the delinquent, while I deliberately administered twelve hard strokes on his bare back with my stirrup leather. A similar case was that of the Yuz Bashi of Oshbeldu, who had defrauded several villagers, asserting that I had not paid for the supplies I had received. It seemed to me that this offender was worthy of being dealt with at Yarkand by the Chow-Kuan, but the news of the summary justice there meted out to the Yuz Bashi of Tir, inclined the men of Oshbeldu to mercy, and at their earnest entreaty, I myself administered a firm but moderate castigation to the fraudulent calumniator.

Having no confidence in the information given us concerning the frequented routes, I resolved to go and examine the country as far as Kosarab, though Dalbir Rai and I were still unfit for work. The ford between Taklay and Aytash presented no difficulty as the river there is very broad, and on February 23rd was very low. In the day's march from Aytash to Kosarab the river had to be forded twice, but more troublesome than the fords were a sharp corner which the camels had difficulty in turning, and a couple of rocky ascents up which the baggage had to be carried by men from Kosarab. Coal, iron, and, I was told, copper, are found at this village, but there is little enterprise, and the minerals are scarcely worked. Further than this point we found it impossible to advance. The narrow valley was bounded by precipitous mountains; the track, which only reached to Yajek, was frequently too narrow and steep for baggage animals, and we were precluded from trying the opposite bank by the river, which was too deep and swift to be forded.

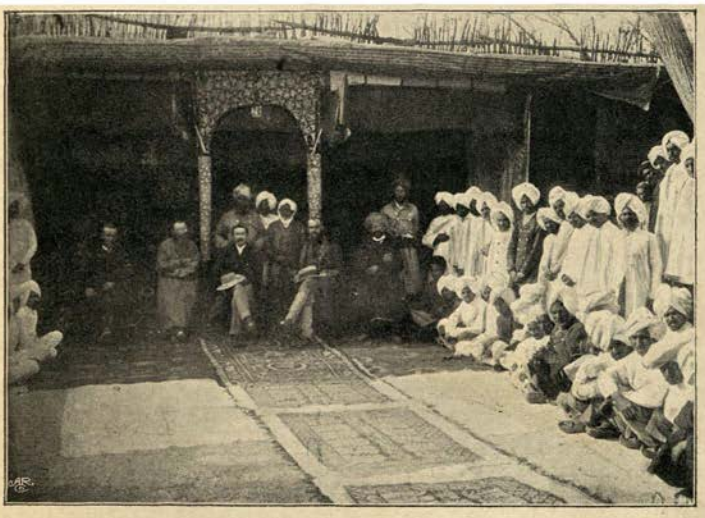
This part of the Yarkand River is called the Zarafshan (literally, "full of gold") River, but the names of Raskam, Chiung (large), and Yarkand River are also employed. The name Zarafshan is doubtless given from the fact that gold is occasionally found on its banks, washed down in summer from the higher grounds.

On March 1st we re-entered Yarkand with our sick list increased. The cold, foggy, windy weather had put too severe a strain on Utam Singh, and he was laid up for a long time with fever.

It was with very great pleasure that I heard of the arrival of another European, Mr. George Macartney, the Special Assistant for Chinese Affairs to the Resident in Kashmir. The ordinary residence of this official is at Kashgar, but he pays an annual visit to Yarkand. We resolved to have quarters in common, and, as my house at Kolkachi was too small for both of us, Macartney rented a much larger establishment, not far off, called Chini Bagh, to which I removed a sufficiency of my belongings. About a fortnight later we were joined by a very accomplished Roman Catholic Missionary, Father Hendriks, a Dutchman who, in the course of a long residence within the Chinese Empire, had become familiar with the languages and the customs of this part of the world. He was now stationed at Kashgar, where Mr. Macartney's influence and hospitality were employed in mitigating the hardships of his lot.

When the Forsyth Mission had visited Yarkand, quarters had been assigned to its members in the Yangi Shahr, and there Colonel Trotter had made his nocturnal observations. The spot where mine were now carried on was in the outer courtyard of Kolkachi, within a few yards of the door leading into the garden. I was desirous of determining the difference of the longitude of the two places, and, to do so, it was necessary that I should have

access to Colonel Trotter's old station. The place was now under military control, and when Macartney, on my behalf, applied to the Chow-Kuan for the requisite permission, he was informed that the proper person to apply to was the commanding military officer, or Teetai. To this personage we sent an intimation, with the customary formality, that we intended to visit him, and without delay proceeded to his abode. On reaching his door,



MR. G. MACARTNEY'S RECEPTION BY THE INDIAN TRADERS AT YARKAND.

however, we were informed that he was engaged with other visitors, but that, if we waited a little, we could see him. This message was unmistakably an insult, for we knew that the Chow-Kuan was not then his visitor, and there was no other dignitary in the town who should not have been required to leave in order to give place to Macartney. We at once returned to the Chini Bagh and despatched the Aksakal, within whose jurisdiction our

dwelling was situated, to the Yamen to demand an explanation. The Aksakal came back with many apologies from the Teetai, who professed to be deaf, said he had not been properly informed by his servants of our intention to visit him, assured us that these careless menials would be beaten, and promised that he would visit us next day. True to his word the Teetai, soon after breakfast next morning, appeared at the Chini Bagh, and, on entering Macartney's room, at once began to kotow to him, bringing his forehead down to the ground in token of humble apology. The action was directed to Macartney who, in politeness, was required to acknowledge it by a like movement, while I was free to enjoy the spectacle. My friend was not quite convinced of the good faith of our visitor, who might slyly leave the ceremony incomplete, and he resolved to reciprocate no further than occasion demanded. His observation was hampered by his white helmet, which dropped over his face as he bent towards the ground, but he was able by stealthy glances to assure himself that the Teetai really did kotow, and when both had thus humbled themselves, the reconciliation was complete. The Teetai, a profoundly ignorant man, raised some difficulty as to the purpose of the observations I wished to make, for he persisted in thinking that the result would somehow enable me to throw cannon balls within the city with unerring precision. However, objections were got over, and I obtained the necessary permission which, as the Chow-Kuan entered before the visit ended, received the approval of the civil as well as of the military authority. Accompanied by Father Hendriks, who kindly interpreted for me, I had no trouble in making the observations, and the difference of longitude was accurately determined chronometrically.

My original intention was to complete my survey operations in the Yarkand region and then to proceed

SCENE IN THE TAKLA MAKAN DESERT.

eastwards into Tibet. The purpose of my journey, however, being still unfulfilled, I had to rearrange my plans. I resolved to spend the summer months in Tibet, and I clung to the hope of being able to explore the unknown stretch of the Yarkand River, when it would be frozen over in the coldest weeks of the following winter. It was still too early in the season to start for Tibet, and Macartney suggested that I should make a short excursion into the Takla Makan Desert. He was acquainted with a man named Islam Akun, who had often sold him books purporting to be ancient and to have been found in the Takla Makan. My friend was not the only purchaser of these books, for Petrovsky and nearly all European travellers in the region had been induced to buy them. The man professed to be acquainted with buried cities in that desert, and he agreed that, acting as my guide, he should receive no payment until he had brought me to at least one buried city not previously visited by any European.

During the visit of Macartney and Father Hendriks to Yarkand, Mr. Backländ received interesting information concerning the manufacture of ancient Kotan manuscripts, his informant being a boy, the servant of Dr. Josef Messrur, a Persian missionary. This youth, while at Khotan the year before, had struck up a warm friendship with another boy, the son of an enterprising producer of ancient manuscripts, and the information which reached the Swedish missionary through these lads was probably true in substance.* According to the statement of the boy, the books consist of pages printed from blocks of pear-tree wood, many of the characters used being from genuine old documents. After being printed the pages are hung up in chimneys until they assume the required old look, and are then fastened together in books

* See "A Report on the British Collection of Antiquities from Central Asia," by A. F. Rudolf Hoernle, C.T., Ph.D. (Tübingen).

with copper nails which are prevented from tearing the paper by copper plates. The leaves are next slightly damped and sprinkled with sand, the copper nails and plates are treated with acid to produce verdegris, and the completed article is buried in the desert where it will be found when wanted. The name and habitation of this book-manufacturer were not disclosed, but it was understood that the man was Islam Akun, and the place Khotan.

Curiously, not a single ancient manuscript (true or false) was offered for sale to me during my first visit to Khotan, though I inquired about them and announced the fact that I was eager to purchase. Probably it had leaked out that the system of manufacture had been disclosed, and the owners of genuine manuscripts had considered it prudent to avoid the appearance of complicity in the fraud, by refraining from offering even genuine books for sale.

Having arranged to travel into the desert under Islam Akun's guidance, I set about preparation. The chief difficulties being that of water supply, I had iron tanks constructed with padlocks to keep the contents secure. I questioned Islam now and then about his plans for the journey, and he always adhered to one general outline of his scheme. Sometimes, however, the distances of the buried cities would vary, and the book-making system attributed to him put me on my guard. My suspicions were not fairly awakened till the tanks were completed, and then, thinking it a pity not to use them, I decided to spend a portion of the spring in the desert, where, if I could light on no buried cities or books, I might at least unveil a fraud. It was on April 12th that I left Yarkand bound for the east. The loads had been arranged two days before, but Asiatics are slow to begin a journey, and it was not till a late hour that we were fairly on the way.

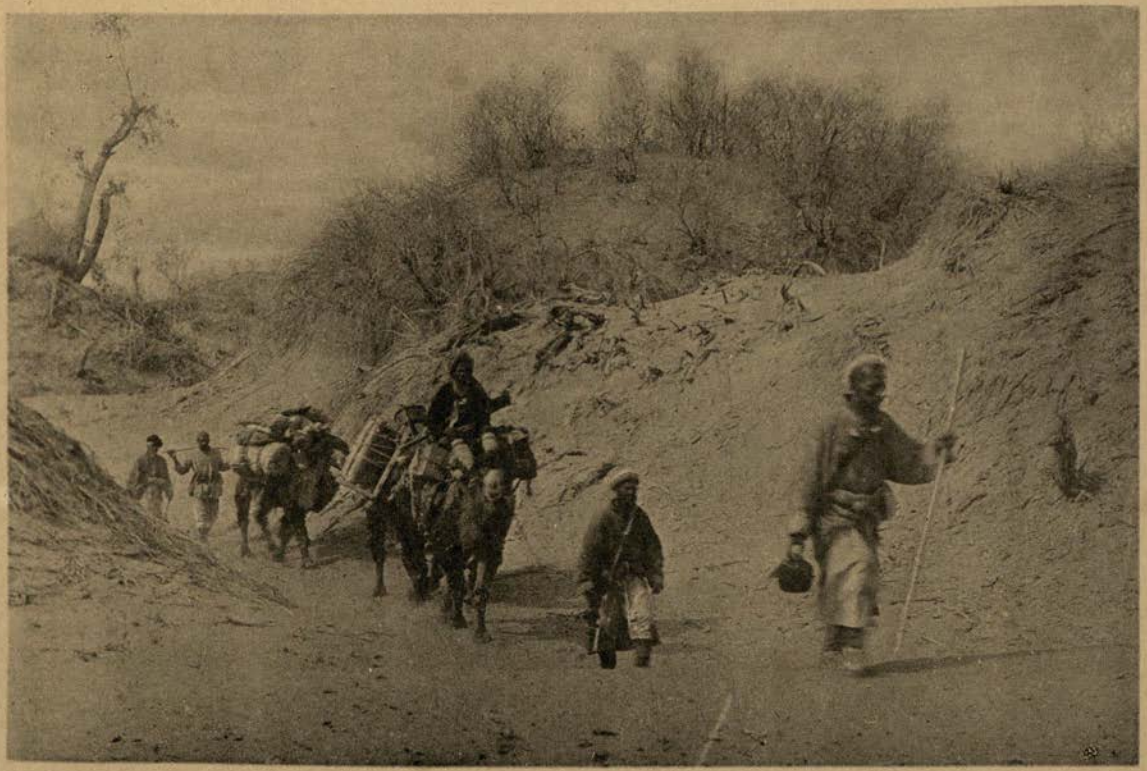
CHAPTER X

Departure from Yarkand—Guma—The Takla Makan—Kara Targaz—Waste of water—Ignorance of guides—Lucky return—Punishment of guides—Return to Guma—Journey to Khotan—Khotan—Islam Akun rewarded—Run on the medicine chest—Diseases—Chloroform—Important operation—Departure for Polu—Chaka—Hazy weather—Escaping attention—Entertained by a Mullah—Polu—Stay at Polu—Negotiations with Chinese—Anxiety about Ladakis—Kiria—Delay there—Night march—Sorgak gold mines—Raju very lazy—Kara Sai.

THE weather was now comparatively warm, the temperature in the shade, at 2 p.m. on April 11th, having been 78° F., and I was desirous of getting over the short distance to Posgam before noon. So far as I could make preparation, everything was ready, but travellers in the East are dependent on Orientals in whose promises it is unwise to put implicit trust. The Aksakal had been deputed by the Chow-Kuan to attend to my wants while I was in Yarkand, and from him I had obtained the promise of a marpa, or small cart, which was to be ready at an early hour to convey the tanks as far as Karghalik. The hour came but not the marpa, and it was not till after mid-day that a vehicle could be secured. The driver set a high value on the service which was required, demanding a fare about four times that usually asked. In the bargaining, the Aksakal supported the driver, but the demand being ultimately reduced by about one-half, I agreed to

pay 30 tongas (the usual charge being from 16 to 20), and soon after one o'clock I was on my way towards the desert. This route was well known to European travellers, and it seemed unlikely that any uncertainty existed as to the correct geographical position of the villages along the road. But in the evening of the first day after my departure from Yarkand, time hung heavy on my hands, and, as two of the chronometers were going very steadily, I set about taking astronomical observations to check the position. The result of my work differed from that of previous travellers as indicated on the maps, and I thought it well to continue the observations, checking the longitude at each halting place.

At Karghalik, after some little difficulty and delay, three camels were obtained from a neighbouring village, and these joined me a few days later at the oasis of Guma. From this fertile spot a portion of the caravan accompanied me one day's march to the oasis called Kara Targaz, where we found many large trees in full foliage. Not far beyond this, we entered on the famous Takla Makan Desert, the appearance of which surprised me. The landscape was quite green with a profusion of jilgan, a species of tamarisk, and trees, which seemed as if bursting into leaf after a long drought. The large sand-dunes, some nearly 20 feet high, were covered with jilgan and invariably surrounded with a ditch, narrow and shallow but very sharply defined. Among these sand-dunes I and my companions, Dalbir Rai, Raju, Islam Akun, two local guides, and the camel man with the camels, slowly wended our way. So slowly did we move, and in such a winding course, among the dunes and ridges, that we were at no great distance from Kara Targaz when we found it necessary to bivouac for the night. We used up the water in two of our portable tanks, two of the camels having drunk freely from a



TRAVELLING IN THE TAKLA MAKAN DESERT.

large wooden bowl provided for their use, though the third, being untrained in this manner of potation, could not be induced to do so. These two tanks we left for a fresh supply, which was to be brought from Kara Targaz.

Next day I rose early, and, after awakening my sleepy company, found it necessary to remonstrate strongly with Dalbir Rai, whom I found coolly enjoying his morning ablutions as if water had been superabundant. We continued our march through a country which presented little variation from that which we had traversed the day before. The presence of a tiny green plant with long roots led me to hope that water might be found beneath the surface, but though we dug deep in the bed of a small ravine, we found none. It seemed marvellous that the diminutive plant could live and thrive in this parched land, where the sand by day was so hot that even the natives, with their thick-skinned bare feet, could not stand on it for any length of time.

At the end of our second day's march in this desert, I found that we were almost exactly on the parallel of 38° N. latitude. Next morning, when we had gone a short distance from the spot where we had bivouacked, it became clear that our guides were quite unfit for the work they had undertaken. When questioned, one of them admitted that he had forgotten the direction we ought to take, and I at once gave the order to return. It had been no part of my purpose to attempt a long desert journey at this season, but the incompetence of guides, who were at fault after only two short marches, was irritating. I tried to lead the party back to Kara Targaz by the straightest course, but this effort had to be abandoned. In all directions the landscape presented one unvarying appearance; the trees seemed all of one height and the sand-hills all of one shape. Again and again I sought to keep a distant object in view to direct my

course, but, as we advanced, the chosen point was intercepted by dunes or ridges which had to be circumvented, and, when our prospect was again unimpeded, it was impossible to identify the former landmark. As we walked back, patiently following the track of our outward march, one of the guides confessed to Raju that he had never been so far into the desert before, and expressed his satisfaction that the order had been given to return. To escape the heat and to mitigate the discomfort they experienced from the want of water, the guides scraped the hot sand from the surface and embedded themselves in the cooler layers beneath, where they remained till near sunset. On reaching Kara Targaz, Islam Akun, the chief delinquent, was nowhere to be found, the two local men being left to suffer whatever penalty might be awarded. These two were merely dupes of Islam Akun, and having detained them two days in fear and dread, I let them go without further punishment; but on reaching Guma I induced the Beg to take means to secure the arrest of the chief offender.

Having made satisfactory observations for the determination of the rates of the chronometers, I resumed my journey towards Khotan. It lay mostly through desert, where, now and then, a little scrub relieved the monotony of the sandy waste. We passed through several oases, in all of which, owing to the scantiness of the winter snowfall, there was scarcity of water for irrigation. The annual rainfall is very slight, and it is to the melting of the snow on the Kwen Lun range in the spring and summer, that the inhabitants look for water for their crops.

On May 5th I reached Khotan, where a cool and roomy house on the north side of the street, and a few hundred yards east of the Yangi Shahr, was prepared for me. As a dwelling, this house was excellent, but the garden

attached to it was small, and there was not sufficient open space for observing. For this purpose I had to betake myself to the roof, which proved so shaky that it was only by placing two of the feet of the theodolite on the main wall and keeping my assistants perfectly motionless, so as not to disturb the third foot while the levels were being read, that I could accomplish the work.

I had not been long in Khotan when news reached me

ISLAM AKUN IN DISGRACE.

that Islam Akun had been taken, and had been sentenced by the Chow-Kuan to wear the cangue, a large square board, weighing about 30 lbs., round his neck for a month.

At this town, letter writing and the dispensing of medicines occupied most of my time. I had a well-stocked medicine-chest, and, having had occasion to administer drugs and even to perform surgical and dental

work for the benefit of members of my own company, I suddenly found my medical skill in demand. Among the caravan men was one Sonam Sang, who, having been shown his photograph when in Srinagar, covered his face with his hands and uttered a groan of horror at his own ugliness. This man now suffered from a large and deep-seated abscess which required to be opened. Having a good supply of chloroform, I put the patient under its influence and successfully opened the abscess. Anæsthetics had never before been heard of in that part of the world, and great was the surprise of the onlookers. The patient himself, on regaining consciousness, required the repeated assurances of his compatriots to persuade him that the knife had actually been used.

A few days later, a wealthy landowner applied to me for surgical assistance of a more difficult sort. He had been carried two marches to see me, but as I had not the proper instruments, I was doubtful of my ability to benefit him, and declined to operate. But the poor man looked so disappointed and so firmly refused to go till something had been done, that I was induced to assent. Notwithstanding my fears, the operation proved successful, and, not long afterwards, I was told that the patient, who for six years had been unable to sit on horseback, had resumed his habit of riding.

Khotan and its neighbourhood, though possessed of no large manufacturing establishments, have important cottage industries. These comprise carpet-weaving, silk-weaving, the making of felt rugs, and the cutting and polishing of jade. For jade, the town is a well-known market, and I was desirous of purchasing some good specimens. Jade of the best quality is very rare and can be obtained only in small pieces, such as are suitable for rings. I went round the dealers and workers, and none of them would even think of accepting a commission from

me to procure large specimens. The invariable reply was, "If you get the stones, we will cut and polish them according to any model you may show us, but we cannot get stones both large and good."

On May 18th we set out from Khotan towards Polu, where we knew the climate was cooler and the surroundings more pleasant. At the long, straggling oasis of Chaka I remained for ten days. This oasis is close to the Tekelik Tagh range, which, though not in itself of great importance, contains two peaks whose positions have been carefully determined by the Great Trigonometrical Survey of India. I hoped, therefore, to obtain the longitude of Chaka by triangulation, but the season of thick haze had set in, and, for the present, the attempt had to be abandoned. On May 31st, the morning when I left the Chaka oasis, there were two hours of clear atmosphere, and I had an excellent view of the great Kwen Lun mountains, still covered with snow at the higher altitudes.

In this region European visitors were very rare, and as I proceeded from village to village news of my approach went before me. Begs and Yuz Bashis desired to welcome me, and so often were their demonstrations repeated, with escorts and other display, that such performances became intolerably wearisome, while the coloured eggs, bread, and sweetmeats which I received by the wayside proved costly, as they had to be acknowledged by presents of much greater value. All but the very poorest inhabitants of Sin-Chiang were accustomed to ride, and a sahib who wished to be respected among them required to be well mounted, and attended by a numerous retinue. In short, compliance with the usages of the country became unendurable, and I sought means of escaping unwelcome attention. In the hot weather I set out early in the morning, alone and on foot, so that my day's march was

accomplished before noon. Behind me came Abdul Karim with my riding pony, of which I made use only when the day was very hot. One morning, just as I had overtaken Ipay with the camels, an excited Yuz Bashi galloped up to him and inquired for news about me. The camel man pointed me out to him, as I stepped along in the cool morning air, bareheaded, clad in an ancient and patched khaki suit and grey flannel shirt, without any attendant; and the Yuz Bashi, surprised and incredulous, thinking he was being imposed on by my people, created much amusement by his perplexity.

The inhabitants of this region (as, indeed, of most others that I visited) welcome British travellers, and, when not forbidden, are willing to assist them. In Sai Bagh one of the most important residents insisted on my partaking of tea and sweets at his house. A little further on a rich and influential mullah had prepared for me a substantial breakfast, which, though I had but recently had a hearty meal, I found it impossible to escape. When I pleaded my utter inability to avail myself of the proffered hospitality, my host seized the bridle of my pony on one side while his friends took hold of it on the other, so that I was constrained to dismount and eat of the baked mutton and bread prepared for me and my men. The repast was spread in great simplicity. Seated on the ground under the shade of some large trees we were provided with bread, large, round, and thin, to serve for plates on which the viands were laid. While the other guests, in primitive fashion, tore the meat from the bones with their teeth, I was able to facilitate matters by using a knife, which was my constant companion.

The last day's march to Polu was long and fatiguing, as it included an ascent of more than 3,000 feet from Imam La to the high plateau above the village. This plateau, consisting, in fact, of a long, broad, and gently

sloping ridge, running, roughly speaking, due north from the Kwen Lun range, is used as a grazing ground for large numbers of brood mares and their foals, and for flocks of sheep. Here the scenery provided a delightful change from that through which we had passed since leaving Yarkand, and the long stretch of green ridge, with the majestic Kwen Lun range rising abruptly before us, gladdened the heart. Almost due east of Polu a fine

GENERAL VIEW OF POLU.

double peak, 21,850 feet in height, which I wrongly assumed to be Anshe Tagh, stood boldly out, forming a prominent landmark when not hidden by the prevalent haze.*

From the crest of the ridge we had to descend more

* Repeated attempts to identify Anshe Tagh failed. This name is quite unknown to the natives of Polu and adjacent villages, who call the Kwen Lun range "Snow Mountains," and some of the principal peaks "Chakal" or "White Mountains."

than 2,000 feet, the latter part of the descent being very steep and over deep sand. At the bottom of the valley flows the Kurab River, on fording which we found ourselves at Polu. The village is small but compact, situated on a ridge a little above the confluence of the Kurab and Terelik Rivers, and about two miles south of the point where the united stream flows into the Kiria River. A comfortable house, belonging to a rich man, was vacated for me, and every civility and assistance was proffered, but, nevertheless, symptoms of coming trouble soon appeared. An official, deputed by the Chow-Kuan of Kiria, and attended by a Mohammedan interpreter, came to the village and professed himself desirous of helping me. I had been expecting men from Leh with baggage-sheep, corn, money, and sundry other articles, and, being doubtful whether they would be able to find their way unaided across the mountains, I had despatched a man well acquainted with the route to look out for them. Soon after my arrival at Polu this man returned without having seen the Ladakis, but having, in accordance with instructions from me, "cached" food for them at Ulugh Kul. After this, the Chow-Kuan's envoy, though in my presence he gave utterance merely to soft nothings, threatened the natives with dreadful punishment if any assistance should be given me in travelling by Carey's route to Ladak, here known as Tibet.

Chinese opposition works, by preference, underhand, and for a time things went on smoothly. In the mornings many villagers visited me, some desirous of medicine, others anxious to be relieved of troublesome teeth. The extraction of teeth, I was told, was usually performed by the village farrier, who, while the patient was held by two or three men, applied his huge pincers and pulled out not merely the one offending organ, but often some inoffensive teeth besides. The small size of my forceps, and the

rapidity with which my patients were relieved, ensured me a large dental practice. On some days it was difficult to go out of doors without being waylaid by sufferers or applicants for medicine. One morning, after having attended to many patients, I thought I might venture forth for a walk, but at the door I was met by the Yu Bashi holding a man, who extended his arm towards me and muttered "Issok, issok" (hot, hot). According to native notions diseases were either "hot" or "cold," and it was the duty of the medicine man to determine which description applied to the case on hand. I felt the man's pulse and found it normal; his tongue was of the proper hue, and his temperature was not high; still he kept repeating the word "Issok, issok," with which I thought myself familiar. I re-entered my room and brought out a box of pills, which I knew could do no harm. The man had a look of surprise as I proceeded to administer the drug, but just then Raju approached, and, after a little questioning, informed me that the applicant had said, not "Issok" (hot) but "Issuk" (donkey), asking payment for the hire of his donkey the previous day.

In the hope of obtaining guides and other assistance for a journey towards Ladak to meet the overdue men, I entered into negotiations with the Chow-Kuan of Kiria, and, while these were pending, pitched my camp on the high plateau I had already crossed. The place was exposed, waterless, and destitute of fuel, but its position was suitable for the purpose of measuring a base-line and determining the height of the principal adjacent peaks, including the double peak already mentioned. During the first day I had clear weather, but afterwards a dense haze overspread the country, so that even the near foot-hills were obscured, and surveying became impossible. For ten days I waited in that cheerless place, hoping that the veil would rise; and the tedium became intolerable,

I was bent on work which could not be done, and mere amusement or the killing of the time seemed "flat and unprofitable." My literary stores were of the scantiest, and had they been abundant I could not have enjoyed them. For a day or two my dog "Zambôk" diverted himself and me with his vain pursuit of marmots. Then I entered on the search for botanical specimens, but there was little scope for the gratification of this taste, and I discovered that the most satisfactory method of relieving the monotony of existence was to sleep. Continuous sleep being impossible, my waking thoughts turned homewards, and, to my sorrow, I found that memories and longings which, when one is actively employed, only give rise to healthy hopefulness, may become oppressive and painful when the mind has no other resource. Occupation, however, was provided for me by the illness which overtook Utam Singh. The fever with which this trusty Hindu had been attacked at Yarkand kept him weak, and when I had removed my quarters from Polu village to Camp 73 on the high plateau, I had brought him with me in the hope that rest and the bracing mountain air would hasten his recovery. Unfortunately his health became worse, and I was in great perplexity as to the malady from which he suffered. His temperature rose, his mouth became so swollen that only the tip of his tongue could be seen, and his voice was almost inaudible. By putting my ear close to his lips I could distinguish articulate sounds, but their meaning I could not make out. The most distressing feature in his case was the unbearable stench which proceeded from his body, and which made me fear that he was suffering from some contagious or infectious disease. I had his tent pitched some hundreds of yards from the camp on a breezy spot, and there the poor fellow lay in solitude. He and Changfûnchuk had always been good friends, and now the one

companion was not unwilling to minister to the comfort of the other, but he was directed never to remain longer in the sick man's tent than was necessary. Dass, the cook, obtained milk and prepared soup for him, and poured these supplies into the sick man's cup at the

A CASE OF ELEPHANTIASIS.

boundary line beyond which no one was allowed to step except Changfûnchuk. Usually I paid him a visit three or four times a day to observe his temperature, to ascertain his wants, and to administer medicine. No drugs which I gave him seemed to do any good, and my efforts to diagnose his case were fruitless. However, he began

to mend, and gradually became so much better that I resolved to have him removed to Yarkand. I travelled with him to Kiria, the patient being carried most of the way on an improvised litter. From Kiria he was able to proceed by easy stages by night in charge of Ipay, the camelman, and on reaching Yarkand was received by Dr. Josef Messrur, the Persian missionary, who looked after him till my return in October.

Meanwhile my negotiations with the Chow-Kuan made little progress. It was quite clearly understood that I had no intention of going to Ladak, but only wished to proceed as far as Aksai Chin and return to Polu within two months. He told me repeatedly that the territory through which I wished to travel was Chinese and within his jurisdiction, yet I could get no satisfactory or even definite reply. No Chinese official with whom I ever had dealings could be induced to transact business in a reasonable way. If opposed to my advance, as a Chinese official might be assumed to be, he would talk about the dangers of the journey and the terrible hardships former travellers had had to endure, but he would not say "You must not go." Being resolved to bring the negotiations to a distinct issue, I decided to pay a visit to the chief obstructionist at Kiria, and, presenting myself at the Yamen, was admitted to his presence. He had a very haggard, effeminate appearance, suggestive of the habitual use of opium, and he was evidently in bad health. My first visit was ineffectual, but when I called a second time some progress was made. He said he would not assist me or my people to go to Aksai Chin by way of Polu, but he undertook to send men and supplies from Polu to meet the expected Ladakis. I promised that I would return to Polu in two months, and said that I now required only an order to the Beg of Polu authorising him to allow the villagers to assist me with guides and transport. This he

refused, but he agreed to sanction my travelling by Sorgak to Kara Sai, and obtaining the necessary assistance.

Before my departure from Kiria on June 27th, I had occasion to send a message to the Chow-Kuan, and he took that opportunity to request me to survey the frontier between Sin-Chiang and Tibet—accurately, but on no account to place it too far south. This request made it plain that he was quite aware of my intention to continue the survey operations, which, in fact, I never concealed from the Chinese or any others.

The season was now well advanced, and the thermometer indicated a temperature of 96° F. in the shade at two o'clock in the afternoon, the difference between the wet and dry bulb temperatures being about 30°. To avoid the scorching heat and prevent needless distress to men and animals, I resolved to travel by night; but this arrangement was displeasing to Raju, who, pretending not to have understood the order, was not ready to start at the proper hour in the evening. On the second day he followed a similar method but without the pretence of mistake, asserting that it was impossible to march at night, but that the desert journey of thirty miles to Sorgak could easily be accomplished in the daytime. I gave him the requisite orders as to feeding the animals and the supplies to be carried for the night's march. After much protestation and display of bad temper, he began the preparation, and soon after six o'clock in the evening we set out. In about four hours we reached the low hills of loess and sand, called Awras, whither water for the men had been sent on donkeys. By the time we had refreshed ourselves and were ready to resume the march it was too dark to see the footprints on the sand, vaguely described as a road, and our halt had to be prolonged.*

* The word "road" means any path. It may be applied, on the one hand, to the track of an expert mountaineer, or, on the other, to a wide cart-road.

As the night was chilly I wrapped myself in a thin, well-worn numnah lent me by one of the donkey-men, and, curling myself up on the sand, with my arm for a pillow, was soon asleep.

About three o'clock in the morning we resumed our march, and travelled through a country bare and waterless almost as far as Sorgak. About a mile from this village water was found, but the region was still devoid of vegetation. The villagers earn a livelihood by digging for gold, but, from the poverty-stricken look of the place, it was clear that gold was scarce in the neighbourhood. The village houses were miserable hovels, usually mere excavations with roofs almost flush with the ground. Supplies for the villagers had to be brought from the village of Talkolok, about twelve miles distant, or even (if flour was required) from Nia, about forty miles distant.

In the march which ended here we had covered quite forty miles (we had been told that the distance was thirty miles), but the chopped straw, dry lucerne, and corn which the Beg of the village had collected for us and with which he met us as we approached, enabled me to give the animals a well-earned rest. Next day the air, cooled with rain, became clear, and in the evening we had an excellent view of the distant villages on the plains. The few oases, of which Nia was by far the largest, with their bright green fields and abundant trees in foliage, presented a marked contrast to the surrounding country which consisted of nothing but a dreary desert of sand and loess. The eye, however, could not but rest with pleasure on the majestic Kwen Lun mountains, now not far distant, to the south. Here I witnessed a gorgeous sunset, during which the western horizon, almost from north to south, was lit up with rosy red, while, over the sun, an extraordinary effect was produced. A band of reddish yellow, with a breadth of about one and half times the sun's

apparent diameter, and an altitude of about 15°, burst into view, and after a brief display suddenly vanished.

Continuing the journey eastwards from Sorgak, we entered scrubby country with here and there a small village, the houses of which had sloping roofs. When we were about two marches from Kara Sai the men from Kiria, who attended to the hired transport, became troublesome. They had already unreasonably petitioned to be allowed to return, and now they became openly mutinous. In such circumstances the only safe course is to require implicit obedience and, if persuasion cannot secure it, then to compel it by force. I was not ignorant of what had been going on amongst the men, and when my orders to load the animals met with a refusal, I was prepared to act. Abdul Karim, in accordance with my instructions, seized one of the ringleaders and held him prisoner while I walked up to the other and, with my left fist, delivered a firm blow straight from the shoulder. The man staggered and was about to fall, but I kept him upright by a second blow which was speedily followed by a third. The second and third blows, though not administered in the way of punishment, but rather for assistance and support to the crestfallen delinquent, evidently convinced him that more would follow if required. While he stood dazed and terrified, the whole of his companions fled, save only the man whom Abdul Karim had secured. The proceedings now became farcical, for it was evident no danger would arise from the Kiria men; but it was necessary that the comedy should reach a proper conclusion. I sent for a stirrup leather which was hanging from a saddle at some little distance, and for some ghee (butter often rancid) to oil it, and, advancing to Abdul's prisoner, I explained the nature of the operation to which he was about to be subjected. The man became abjectly penitent and protested that he would give no

more trouble, but I refused to listen to his confessions or accept his assurances. At length, however, Raju, acting on instructions, came forward and performed the part of intercessor. Though he begged hard, it apparently took some little time to incline me to mercy; but when I had been assured that all the Kiria men would return to their duty, I accepted their unreserved submission and released the prisoner. It was surprising how soon the disturbance

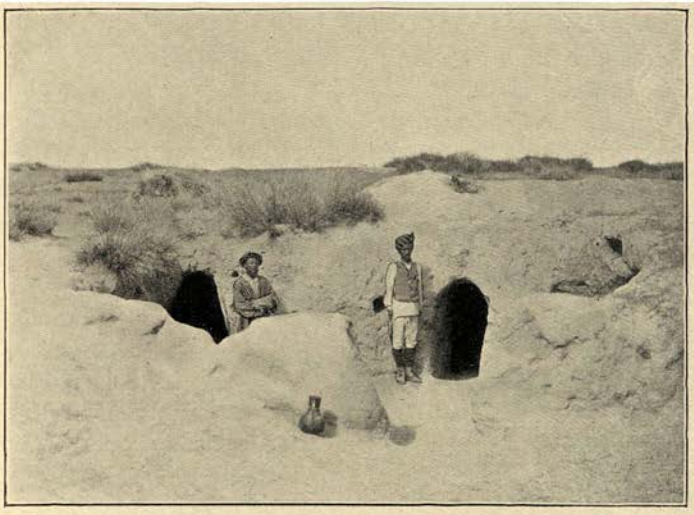
Raju, caravan bashi. Changfûnchuk.

TYPES OF LADAKI CARAVAN MEN.

was at an end. There were eight or nine men who had plotted together, and there was no man but Abdul to whom I could look for help. I had no weapon; my revolver was in my bedding; my rifle was on my saddle at some distance. Had the men been resolute, I should have been at their mercy; but within a very short time the baggage was loaded up, the caravan *en route*, and disobedience on the part of these men quelled for ever.

Thenceforth the troublesome member of my company was Raju, who had become lazy. He shirked his work, neglected the necessary inspection of the animals after our marches until remonstrated with, and when we reached Kara Sai he became no better than an agitator and a creator of discontent. Of this, however, I pretended to know nothing.

Kara Sai (Black Water), so far as architectural forma-



MY ABODE AT KARA SAI.

tion is concerned, consists of a few small caves, hollowed out of the loess which forms the eastern bank of a tiny stream at the place where it leaves the hills. Close by are one or two patches of stunted barley; not far off there is good grazing for camels, and on the hills abundance of vegetation for flocks of sheep and goats, which, at night, are regularly tied up in the narrow parts of the valley beside springs of excellent water. The best cave in

the village was cleared out for me and served for my abode. It was not roomy; its entrance (as the photograph shows) was low and narrow; if one touched the walls or roof a shower of loess fell, but the dwelling had the advantage of being pleasantly cool. The headmen of the village consulted together, and agreed to supply me with fresh transport as far as Yepal Ungur on the Kiria river. This arrangement was satisfactory to all concerned, but chiefly to the Kiria men, who were now paid off and at liberty to return home. Thinking that possibly some of these men had been impressed, and believing that only two of them had been to blame for the trouble which had arisen, I gave some backsheesh to all but the two ringleaders, whose surprise and disappointment were depicted on their faces when they found that they were deliberately passed over.

CHAPTER XI

Departure for Tibet—Chinese post—Tolan Khoja valley—Second journey to Tibet—Atish Pass—Shor Kul—Digging for water—The Kiria River—Yepal Ungur—Bad weather—Reconnoitring—Raju leaves for Polu—Journey to Aksu—Beginning triangulation—Return to Yepal Ungur—Departure of Kara Sai men—Fine snow range—Going east again—Reconnoitrers useless—Bad health—No feasible route—Yepal Ungur once more—Fording Kiria River—Ruin at Baba Hatun—Sources of Kiria River—Numerous glaciers—Journey to Yeshil Kul—Return to "Fever Camp"—Connecting with 1896 work.

BY July 9th the promised transport had been provided, and next morning we set out from Kara Sai. The caravan consisted of 15 ponies (10 for baggage and 5 for riding), and 10 donkeys, besides 7 hired ponies and 11 hired donkeys. In addition we had 8 donkeys to carry food and other stores for the men who accompanied me from Kara Sai. For the sake of fresh meat I had obtained and sent on a day's march in front, twenty sheep and for milk two goats, but the milk these animals yielded was not worth the trouble they cost. I took with me a two months' supply of grain, flour, rice, ghee, salt, tea, sugar and spices. My purpose was to examine and survey the country to the west of the spot where Roborovsky had nearly perished, and determine the heights of as many of the mountain summits as possible. It was most desirable to connect the triangulation and the topographic work

accomplished in Tibet during the previous year, with the work on which I was now engaged, and to carry the triangulation across the Kwen Lun range to Camp 73 on the plateau above Polu. I wished also to ascertain whether any feasible route led from Polu towards Central Tibet. I had often heard that there was such a route, and that it had formerly been used by Tibetans, but this was stoutly denied by the Polu people whom I questioned

LOADING THE DONKEYS.

on the subject. Within the memory of the oldest inhabitant of Polu, none but Ladakis had come across the mountains to Polu, and of Ladakis only the few who had accompanied Carey and Dagleish. The people of Kara Sai said that, the only route into the mountains was by the Tolan Khoja valley, and they alleged that they had never seen any people come that way. To be absolutely certain that there is no route practicable for

animals across the Kwen Lun range between Polu and the Tolan Khoja River, one would have to examine every valley in that stretch of country; but I think it highly probable that no such route exists. I was assured that the Kiria valley cannot be ascended as it is blocked by lofty cliffs over which the river falls. This statement is confirmed by the fact that men going from Polu to the upper waters of the Kiria to shoot yak, invariably go and return by the At To Pass and Kha Yak Day.

As the gorge between Tolan Khoja and Khuyek was said to be impracticable for a caravan, we went almost due south for a few miles from Kara Sai, up a very narrow valley inhabited by shepherds. Crossing a low and easy pass, we entered the region drained by the Tolan Khoja River, where the hills were comparatively low and were covered with vegetation. We passed one or two wretched hovels close to the confluence of the Itula Khan and the Tolan Khoja Rivers, and reached Khuyek on the left bank, where, though there were no inhabitants and little grass, we halted for the night.

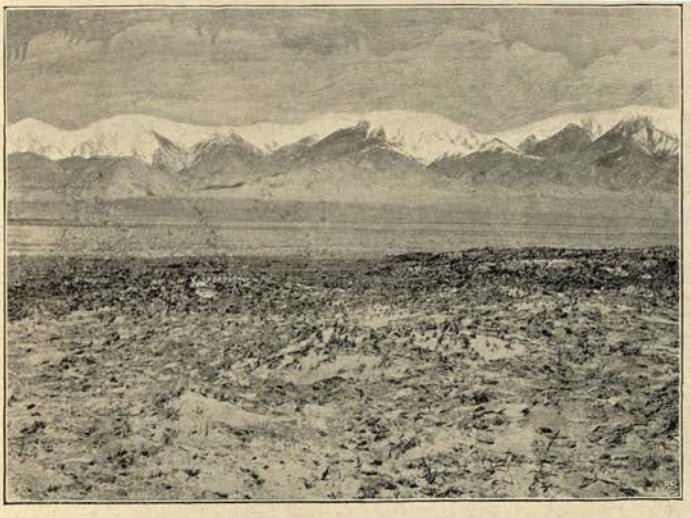
Next day we marched up an easy slope, from the top of which we had to descend a rather steep declivity to Sarok Tuz (Yellow Salt) on the left bank of the Tolan Khoja, just below its junction with a river of about equal volume, the Tuzlok Sai (Salt River), and close to a large saline spring whose waters leave a white deposit. This spot might possibly be of some importance, for it was said to be the point of separation of the two routes to Ladak. The place was very cheerless and without inhabitants, except three or four men who formed a Chinese post, established about a month before. This small company was quartered in a very porous tent, in front of which floated a huge yellow flag. I asked the official in command how it happened that a post had been established at such a place, and was informed that

its sole purpose was to render me assistance and provide supplies, none of which, however, were forthcoming. Doubtless the Chow-Kuan's intention was to have my movements under observation, but he wished also to make it plain that Sarok Tuz was Chinese, not Tibetan, territory, though the possession of such a place seemed not worth asserting. The man in command showed me a paper on which were two parallel rows of thick zigzag lines, interspersed with dots and dashes, and told me that this was the map of the country. It seemed such a map as a couple of spiders, dipped in ink and then turned loose on the paper, might have drawn.

Considering it possible that an old and disused route from Ladak joined that from Yepal Ungur at Sarok Tuz, I thought it worth while to devote a day to reconnoitre. The valley of the Tuzlok Sai, in its lower part, did not present any serious obstacle to the march of the caravan, but after a few miles it became very narrow. On either hand rose barren mountains, those on the right bank being lofty and precipitous, while those on the left, though not so high, were far too steep to be climbed by animals. After ascending this bleak gorge for about 7 miles, Raju and I managed to climb to a spot about 200 feet above the valley, but we could see only high mountains presenting no foothold even for men, and showing not the slightest trace of vegetation. We were thus compelled to abandon all thoughts of proceeding in that direction.

Next day we ascended the valley which, south of Sarok Tuz, is called Sarok Tuz valley, and north of that point the Tolan Khoja valley. We had not gone far when we came on a plentiful supply of grass, in the midst of which we encamped in order that our animals might enjoy a good feed before starting for the bare country of Kan Sai. For the next two marches the fodder consisted

only of a little boortza, supplemented with chopped straw and an increased allowance of corn. On July 16th we crossed the Atish Pass, an easy one, 16,500 feet high, and once more I was in Tibet. From a hill a very little higher than the pass and close to it we had a commanding view, but looking for grass we could descry no patch of green, though we could see the depression in which lies the salt lake, Shor Kul. From east round to



VIEW OF KWEN LUN RANGE FROM SHOR KUL.

the south there were low, rolling hills, in striking contrast to the Kwen Lun mountains to which we were now accustomed. At this point the range bifurcates, one spur running north-east as far as Kara Sai, decreasing in height as it proceeds, while the other, of more uniform elevation, stretches eastwards.

As we descended towards Shor Kul, which lies 1,750 feet lower than the pass, we encountered heavy falls of

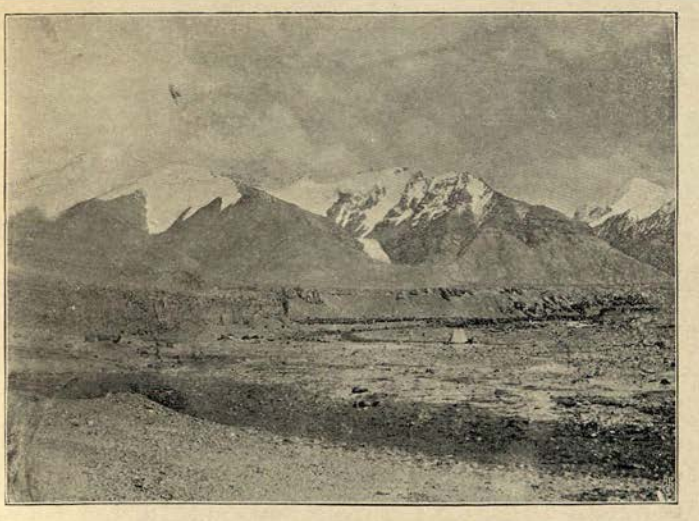
snow, which, however, quickly melted. Next morning the weather cleared and, after making observations for latitude and longitude, I took some photographs of mountains visible from the camp. Nearly all the principal peaks of this section of the Kwen Lun range are over 20,000 feet high, the loftiest I measured being 20,760 feet, and the lowest 20,310 feet. Though the snow and glaciers facing south were exposed to the July sun, we could only see one tiny stream issuing from them. With the exception of this stream, and the little water we obtained by digging we observed no water in this region. There was grass for a mile or two round Camp 90, but elsewhere the country was absolutely barren.

At Camp 91 our altitude was lower than at At Tui, yet several of the caravan men complained of headaches and asked for medicine. My temperature was only 95·4°, or 3° F. below the normal, but my pulse was much faster than usual. This unpleasantness soon passed off, but I suffered some inconvenience from difficulty of breathing in making any ascent. In this inhospitable region we found only a very little stunted boortza, and had to issue the last couple of sacks of chopped straw for the animals. The water we obtained by digging was bad ; it had to be boiled and cleared with alum before it could be used, and there was so little of it that many of the animals had to go waterless.

As we went eastwards our spirits were raised by the discovery of fresh tracks of yak, betokening the neighbourhood of water, and soon we came on the most easterly branch of the Kiria River, in which the baggage animals thoroughly quenched their thirst. Then we climbed the long ascent to Kumboyan, where, close to the head of the pass, we found antelope, abundance of grass, and, by digging, a sufficiency of water. Descending the slope on the other side, we crossed a tiny tribu-

tary of the Kiria River system, a mere brook, quite shallow and less than ten feet broad. In crossing this stretch of country we had had to contend with heavy rain and sleet, but now, at Yepal Ungur, we found a camping-ground where some little shelter (ungur) was afforded by a slightly overhanging cliff.

Running parallel to the Kiria River is a magnificent range of snow-clad mountains, the finest of which, almost



GENERAL VIEW OF YEPAL UNGUR.

due east of Yepal Ungur, has three peaks, the highest rising to an altitude of 22,700 feet, while on either side there are summits almost as lofty. The mountain heights are bold and majestic, but the whole scene is desolate and forbidding. The features are bare rock, ice, and snow. The hard, cold mountain shapes are not relieved by a single tree, nor softened in form or colour by spreading vegetation. A few patches of grass here and there,

struggling for existence, only show the severity of the conditions to which they are subjected.

I remained at Yepal Ungur till the rain and snow should cease, but meantime fresh tracks were found leading from the carcases of two recently killed yak, and indicating that two men with donkeys were going towards Polu. Having resolved to send Raju to Polu to obtain the sheep from Ladak with their loads of corn, I had tried to induce some of the Kara Sai men to act as his guides, but they had declined, feigning ignorance of the route. Their real reason was probably founded on the hostility which existed between the Polu and the Kara Sai villagers, who both claimed the right to shoot yak near Yepal Ungur, the Polu men asserting that the right belonged to them exclusively. Since none would act as guides, I sent Raju on the track of the two Polu yak-shooters. Before this, being myself unable to travel, I had sent out three reconnoitring parties. Changfûnchuk and a Kara Sai man were ordered to search the country east of Camp 91 and south of Shor Kul, for a caravan route where grass and water could be found, leading in any direction between the rising sun and the snow mountains east of Yepal Ungur. Sonam with a companion was directed to ascend the nearest tributary of the Kiria River for the same purpose. Upon both of these parties, the instruction to have the rising sun on their left when starting each morning was emphatically impressed, and a large reward was promised for any useful discovery. The third party consisted of Islam Akun, the guide from Kara Sai, and a companion, their instructions being to ascertain whether it was possible to descend the nearest tributary of the Kiria River to Polu. Islam Akun was a chicken-hearted man, afraid to go, and soon came back with the information that he did not think any one else had ever gone that way.

At length both the weather and my health improved, and I was able to continue my journey. Leaving Yepal Ungur, I went towards the west, intending to approach some of the peaks fixed by the Great Trigonometrical Survey of India. At the next camp the altitude was found to be only 15,900 feet, but the minimum thermometer, on the night of July 25th, showed that the temperature had fallen to 13° F. Notwithstanding the cold, we enjoyed the clear dry air after our long experience of foul weather.

In descending another tributary of the Kiria, not shown on any map, we wasted a whole day. We reached a waterfall which was almost impassable, but, sending Abdul Karim forward to reconnoitre, I set to work to construct a path with stones on one side of the cataract, sufficient to enable the caravan to pass. By the time this road was finished Abdul came back and reported that, lower down, the valley contracted to a few yards and a second cataract made the descent impossible. Returning up the valley, we found the proper route, and crossing a lofty pass reached Aksu, where survey work was delayed by bad weather, and by my own bad health.

The great variation of temperature we had recently experienced had affected the rates of the chronometers, and I was doubtful about my longitude. To secure trustworthy values, I determined to commence triangulation at Aksu, carry the work back to Shor Kul, connect it with that done in 1896 at Yeshil Kul, and then endeavour to connect the whole with the triangulation executed on the high plateau above Polu.

From the hill stations near Aksu I obtained a view of several very prominent peaks in the Kwen Lun range, including the fine double peak east of Polu. To the east of Aksu was a large mountain which hid the snow-clad

mountains near Yepal Ungur, while to the west there was a long range with scarcely a spot on its vestment of snow. In this range the peaks were so numerous and so similar in height and appearance that, it was exceedingly difficult to identify from the second station those seen from the first. However, I was partially successful, and found one summit to be 21,910 feet high, while three others were over 21,000 feet. To appreciate the difficulties with which I had to contend, it is necessary to remember that the country was uninhabited and almost desert, where we had to hasten through our operations before our supplies were exhausted; that we worked at great altitudes, my camp at Aksu being at 15,700 feet; and that the peaks were so lofty and in many cases so precipitous that, it would have been out of the question for one burdened with a heavy theodolite to attempt to scale them in the limited time at our disposal.

Before I left Aksu I was rejoined by Raju, who brought with him the long-expected Ladakis and ninety-five sheep, laden with barley. These supplies had come under the guidance of two men from the village of Tankse, who were anxious for employment. A compatriot of theirs whom I had picked up at Yarkand had become rather lazy, so I dismissed him and put in his place one of the new-comers, a man who had accompanied Dagleish and Carey on their journey from Ladak to Polu.

From Aksu we retraced our steps to Yepal Ungur, where the river had become so swollen that we had some difficulty in fording it. Here Changfûnchuk and Sonam brought their reports concerning the routes, and, thinking that Changfûnchuk's description indicated a country not entirely impracticable for caravan travelling, I resolved to follow his directions. The supplies not required for this journey we "cached," and I had to rearrange

matters with the caravan men. Humdum, a native of Kiria, who had been working in an unsatisfactory manner, asked for his discharge. The Kara Sai men had rendered excellent service, but they had fulfilled their engagement and wished to return home. Not a week longer would they continue with me, but eventually, by the inducement of very high pay, I persuaded one of them, Uzman by name, to take Humdum's place. This

KARA SAI PONY MEN.

man had a brother among those who were returning home, and when the time for parting came the leave-taking was ceremonious. After shedding copious tears, the two men separated reluctantly and slowly. Each had his arms crossed, and, walking backwards, bowed again and again with dignity to his sorrowing brother. The performance was not mere acting, and it would have been pathetic had it not exceeded the require-

ments of the occasion, the parting being only for a few weeks.

Returning towards our old route, we pitched our camp, at the end of the second day's march, two miles east of Camp 91, beside a copious spring of fairly good water, though only a little fodder was found for the animals. The boortza root served for fuel, and the short growth was sufficient for the sheep and donkeys, which crop very close; but the ponies were very scantily fed.

It now became clear that the information supplied by Changfûnchuk was not trustworthy. In his exploration he had not started morning by morning with the rising sun on his left, but on his right, his direction having been north of east. After repeatedly questioning him, I found it was useless to go further east from Camp 99. Besides, this route was nearly destitute of fodder, but the hope of reward had affected Changfûnchuk's view of the region, and had made him blind to its difficulties.

In returning westwards I climbed a very steep and sharp-pointed mountain, whose summit from a distance seemed broader than it was. I contrived, with the assistance of a pony in the lower portion of the ascent, and of men in the higher, to get the theodolite carried to the top, where, earlier in the day, Islam had erected a pillar. The summit contained just space enough for the stand of the theodolite, and I had to move about very cautiously. The western side was for some distance quite vertical, and the other side was so steep that, if one had slipped in any direction, he would have met a speedy death. We made our footing less insecure by clearing away the loose stones, and as there was no wind we were free from one frequent cause of trouble. From this point we could see the stately range on the east of the Kiria River, stretching towards the north-east beyond the

imposing treble-pointed mountain which rose on the east of Yepal Ungur. It was noteworthy that, to the north-east of the three-headed mountain, the snowfields and glaciers of the range were far more extensive than to the south-west of it. Having finished my work on this dreadful peak, I packed up the theodolite, re-erected the pillar, and descended, profoundly thankful that no catastrophe had happened, and on reaching my quarters at Camp 100 (a little to the south of Camp 92) close to springs of good water, I was still conscious of a feeling of gladsome satisfaction.

From this place we again turned to the east, this time under the guidance of Sonam, who, from a spot in the neighbourhood of Camp 102, pointed out to me a lake he said he had visited two years before. In his statement Sonam was quite wrong, as in reconnoitring for me he had mistaken his bearings and gone east of north instead of almost due south as ordered. The region where we were encamped was very bare, with no vegetation except boortza, and but little of that. Owing to bad health, I was unfit to undertake reconnoitring work, and I had to lament the unfitness of my men for any such purpose. The most trustworthy of them was Abdul Karim, and I detailed him, with Islam as a companion, to look for a route leading southwards. Armed with a carbine, provided with a compass and good glasses, and mounted on the best pony in the caravan, he started early in the morning and ascended the river flowing from the south. Expecting his return before dusk I spent part of the day in examining the country about the camp, which was at an altitude of 16,400 feet. Close by, but a little higher up, I noticed a dry watercourse, the side of which presented a peculiar appearance. On a closer examination I observed a deep stratum of dry water-plants, similar in appearance to those that grow on the small lake

immediately to the west of Horpa or Gurmen Cho.* The extent of the deposit I could not definitely ascertain, but its depth was certainly 12 feet, probably more. Interspersed among the weed were many thin layers of blue

* A large mass of these plants, which are probably several thousand years old, was submitted to Dr. A. B. Rendle, M.A., D.Sc., of the British Museum, who has kindly favoured me with his opinion, viz. :—

"The dry water-plants referred to consist of dusty masses of short broken lengths of the grass-like leaves of *Zostera marina*, Linn., the Grasswrack. Its identity is put beyond question by the presence of a few fruits still protected by the spathe. The Grasswrack is a marine flowering plant widely distributed on temperate coasts; its slender ribbon-like bright green leaves are a common object on our shores. Captain Deasy's discovery of remains of this plant at these high altitudes is of much interest. There is no record of its occurrence in Central Asia. It occurs in the Mediterranean and the Black Sea, and on the north-east coast of Asia, while a smaller species, *Zostera nana*, is found in the Caspian Sea.

"*Glaux maritima*, Linn., and *Triglochin maritimum*, Linn., both of which occur in Captain Deasy's list, are similar examples of maritimal plants with a north temperate distribution occurring at high altitudes in Central Asia. Their presence may be explained by a former connection with the Mediterranean basin, indicated by the band of tertiary marine deposits stretching eastwards from the Alps to the Himalayas, and occurring at Leh at a height of 21,000 feet.

"As to the age of the deposits of *Zostera* and blue shaly clay it is impossible to hazard a guess. From their appearance these plant-remains might be only a few years

shaly clay. In times perhaps not very remote a great lake must have extended from this spot eastwards for many miles, northwards to the Kwen Lun, and south-west to near Iksu and possibly as far as the pass near Togral Monpo. The water, probably by erosion, had found a passage for itself through the Kwen Lun barrier and had gone to swell the Kiria River, until the bed of the lake ran dry.

Abdul had not returned by dusk, but with the help of men sent out with lanterns for their guidance, he and Islam found their way back about nine o'clock. Their report showed that for fully thirty miles there was no vegetation, but there was water, and the ascent was easy. It would be possible to get over the distance at the cost of suffering and loss among the animals, provided fodder were found beyond. The advantage did not seem proportionate to the probable loss of animals, and I resolved to take some other course. I was now quite convinced that there was no feasible caravan route leading towards Central Tibet, so I once more bent my steps towards Yepal Ungur, whence I meant to ascend the valley of the Kiria to its source and re-visit "Fever Camp" near Yeshil Kul.

In traversing this valley in the month of July, one might have expected to find everywhere streams and rivers with a steady flow. But in one long stretch of about twenty-two miles we found only one or two tiny

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old; beyond being very dry and dusty and broken they show no alteration, and the internal structure is perfectly well preserved.

"The intermittent occurrence of layers of blue clay points to repeated changes in level in the salt-lake in which the plants were presumably growing."

rivulets, twelve or fourteen inches wide, and these only on hot days. As a rule streams hardly exist except during the hottest hours of the day, and then they become rushing torrents. Close to Camp 103, a streamlet utterly insignificant in the forenoon had by noon become so strong that it swept two donkeys off their legs, and by two o'clock it was a raging torrent. The mountain-sides, hard and precipitous, harbour no vegetable absorbent to retard the descent of the melting snow, and the fording of such a river as the Kiria is not without danger. I hoped it might not be necessary to cross before reaching Baba Hatun, and I went on ahead to examine the route. The almost vertical mountains on the right bank approached close to the river, leaving no room for the caravan to pass. The barrier was insuperable, and the river would have to be crossed. Choosing a spot below a sharp bend in the channel, I crossed and ascertained the least dangerous course for the animals to follow. Then I took up a position in the channel so as to direct the men, and, to some extent, the ponies. There was some difficulty in getting the sheep into the water; for a long time they stood huddled together, regardless of the shouting and pushing of the men, but at last they plunged in and without difficulty swam across. Some of the men and all the large ponies had to wade across again and again, carrying loads of various sorts, and at last the whole of the men, beasts, and baggage were transferred to the further bank. The breadth of the river at the ford was more than fifty yards; the bottom was rough and irregular with large stones, which were invisible owing to the muddiness of the water; the current was swift, and at one place there was a sudden drop to deeper water, so that even the experienced animals had difficulty in keeping their feet. However, we had no more serious mishap than the soaking of clothes and of some baggage.

FORDING THE KIRIA RIVER.

On the edge of a high cliff overlooking the left bank of the river stood the old ruin of Baba Hatun. It seemed strongly built and possessed of an interesting history, but none of my people had any knowledge of it.

From Iksu, where we found the last grassy patch before entering Tibet from Aksai Chin, the route lay over high bare hills on which were some tiny lakelets. From near this point the left side of the Kiria valley was too soft for the comfortable advance of the caravan, and we re-crossed the river, now much smaller, at a ford just below one of the lakes. From the hills we had crossed, and also from Camp 106, we had obtained a wide view of the snow-clad mountains, with many glaciers, lying to the west and south-west. With the exception of some old boortza of little use as fodder, the country round Togral, as far as the eye, aided by powerful glasses, could make out, produced nothing. At this dreary spot, 17,600 feet high, right over against the snow-clad range, the temperature of boiling water was 180·6° F., but only two of our company, Abdul Karim and Rahman, a hard-working native of Kiria, suffered from the thinness of the air. The lakes we passed are fed by numberless rivulets from this range, and from that on the east side of the Kiria, these streams being the real sources of the Kiria River. About the pass, and a few miles to the south of the Togral Monpo, we found a wide expanse of grass, and further on a tract of country of lower altitude.

As we marched along the north side of Yeshil Kul, where the ground appeared waterless, I was surprised to see, close to the north-eastern corner and not many yards distant, a fairly large spring, probably of fresh water, bubbling up through the salt water of the lake. On the shores, especially the eastern shore, the caravan men were pleased to find excellent salt. At "Fever Camp" we found the old positions of our tents and of

the camp fires still marked. The springs which had supplied us in 1896 were almost dry, but another was found. Dalbir Rai and I betook ourselves to survey operations, but the ground about "Fever Camp" did not admit of sufficiently long bases, and we sent a man to look for water ten or twelve miles to the east, where, at the foot of high mountains, there was abundance of grass. The search was successful, and we moved our camp to the new ground. To make sure of obtaining good trigonometrical values for the longitude of this camp (No. 110), we joined the triangulation carried out there to that performed at "Fever Camp." By this means bases of about eight to twelve miles were obtained and connection made with the survey executed in 1896. Still, much remained to be done, for the chain of triangles begun at Aksu was not yet satisfactorily linked to that of "Fever Camp" (Camp 109) and Camp 110.

CHAPTER XII

Magnificent scenery—Wellby's peaks—Strong winds—Returning—Work near Baba Hatun—Return to Aksu—Arrival of Raju with supplies—Checking previous work—Dalbir Rai sick—Ulugh Kul—Sources of Khotan River—Fine yak—Camp 116—Accident to ponies—Finishing surveying—The Polu gorge—Punishing theft—Vile track—Welcome presents—Return to Polu—Dinner to headmen—Dalbir Rai threatens to murder me—Abdul Karim saves bloodshed—Bad weather—Return to Yarkand—Dilatory post.

FROM the hill stations near Camp 110 we commanded a view of scenery which, for extent and grandeur, was unsurpassed anywhere. We were surrounded by mountains, low on the horizon from the north-east to the south-east, but elsewhere lofty and white with snow. The peaks which, with a gap here and there, formed our horizon on three sides, were visible to great distances. In clear weather we could plainly discern mountains to the south of Mangtza Cho, about ninety miles distant, and several times we clearly saw the prominent mountain with the double peak, 23,490 feet high in 35° 19′ 30″ north latitude, and 80° 58′ east longitude.

On the map illustrating the late Captain Wellby's adventurous and successful journey across Tibet, a prominent peak is placed a little to the south of an extensive snow-clad range running almost due east and west. For this range I made careful search from three hill stations near

this camp, but could find no mountains at all corresponding with the representation. The main range lies not east and west, but north-east and south-west, and beyond it flows the Kiria River. The prominent peak a little to the south of the range is 22,350 feet high, and stands in 35° 34′ 7″ north latitude and 82° 20′ 13″ east longitude.

Here clouds would occasionally hang about important peaks for hours at a time, during which I had to sit patiently on the lee side of the station. Strong winds, sometimes with sleet and rain, not only retarded work at the hill stations, but caused trouble on the lower ground, dispersing the sheep and threatening the demolition of the camp itself.

Having completed our survey work we entered on the return journey to Aksu on September 8th, our route being by way of Baba Hatun. At Tongral Chunzak the only sufferer from the rarefaction of the air was the shepherd, Nurbu, who had twice before visited the place without inconvenience. His indisposition continued till we reached a sheltered spot (Camp 112) a few miles west by south of Baba Hatun. Here I completed the connection between the triangulation executed this year and that carried out in 1896, and consequently with that of the Survey of India.

Soon after my return to Aksu, Raju, who had been sent to Kiria for fresh supplies, arrived in camp. He had been directed to request the help of the Chow-Kuan in obtaining transport, but that official not only refused assistance but ordered him not to return to me by way of Polu. Raju, however, had already made arrangements for the first portion of his journey, and, starting at once from Kiria, he was able, by rapid marches, to reach Polu before the villagers had been informed of the Chow-Kuan's prohibition. Here he obtained fresh transport and speedily resumed his march. Raju's success in this matter en-

abled me to extend my journey so as to take in the sources of the Khotan River. The river is formed by the junction of two small streams a little to the east of 35° 36′ north latitude and 81° 37′ east longitude. After two short marches from Aksu, I pitched Camp 114 close beside the right bank of the most northerly of these, and here I carefully and, I believe, accurately determined my position. It was with surprise that I had learned during my first visit to Aksu that the Khotan River was so near. Two hunters had then visited my camp and, when asked whence they had come, had replied that they had been shooting near the sources of the Khotan River, which, they said, were not far off. At first I doubted the truth of this information, but after considering the matter could see no reason for disbelief. Raju told me that, having lost his way when going to Polu, he had been set right by two hunters close to the sources of the Khotan River, but I had betrayed no anxiety to visit them, nor could I discover any motive for deception. A few marches lower down, according to our informants, there were gold diggings on the river bank, worked by men from Kiria; but as I had now only sufficient provisions for the return journey to Polu, I made no attempt to visit the diggings.

In order to accomplish the difficult and delicate task, of carrying the triangulation across the Kwen Lun range to Camp 73, I resolved to remain for a day close to the At To Pass, though at this place, and for miles round it, the country is devoid of vegetation. In anticipation of this day's work I had sent Islam from Aksu to Polu for forage and fuel, and on reaching the spot was grieved to find that he had not arrived. In my anxiety I was early astir next morning, and to my delight saw Islam approaching with a few donkeys laden with wood, chopped straw, and barley, enough for a twenty-four hours' supply for a few

of our baggage animals. The sheep and all the other animals not at present required were sent forward to Kha Yak Day, where they would find grass. My survey work here was delayed by the illness of Dalbir Rai, and I had to record for myself. The hill station most convenient for my purpose was on the top of a sharp peak, not so lofty as that near Camps 92 and 100, but quite as dangerous. I had left two ponies hobbled half-way up the mountains, and while I was busy with my observations on the summit I noticed that one of them became restive, and while trying to move about overbalanced himself and fell. The other (my riding pony) was fastened to him, and both fell and slid and rolled together down the mountain-side. Their descent was stopped at a more level place, but as they both lay motionless I concluded they were killed, and continued my work. Kunchuk went to their assistance, but before he could reach them they both showed signs of life, and greatly to my surprise he soon had them on their feet. The animals were much bruised and cut, but neither had any bones broken, and my saddle was only scratched.

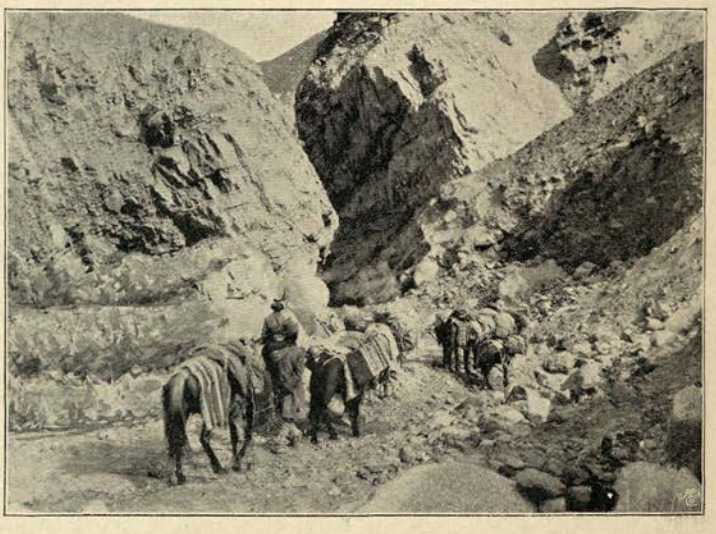
About dusk on our second evening at this desolate place, a fine bull yak came leisurely walking up the valley. Coming in sight of the tents he made a long pause, after which he went on his way at a more rapid pace. What his purpose was in that dreary region we could not divine.

Next morning Dalbir Rai and the others started early for Kha Yak Day, while I with Changfûnchuk, who was useful for heliographic work, completed the survey operations. The descent from the At To Pass into the Polu gorge, though steep, was not difficult. The upper part of the valley was quite waterless; further on we found some springs of undrinkable water, and at this point the gorge rapidly contracted, steep and barren mountains towering on either hand. The rest of the

route was over difficult and stony ground to within a short distance of Kha Yak Day (place where much snow falls), where we found shelter for the night in small, low caves, hollowed out of the loess which formed the bank of a small, dry watercourse. About nine in the evening the temperature stood at about 30° F., and I was obliged to lay aside my fur coat. When I examined the provisions sent forward with the caravan to this place, I found there had been disobedience and theft by the way. Full rations of meat and other provisions had been served out for the journey, but two of the men, consulting only their own preferences, had ignored the rations and chosen their diet for themselves. A strict investigation was made, and the guilt having been brought home to the culprits a moderate punishment was awarded.

From this camp to the neighbourhood of Alajoi the track was steep, narrow, and, where it lay along the bottom of the gorge, very stony. The worst part of it began a little more than a mile to the north of Kha Yak Day. Here, at a spot marked by gigantic boulders, the track left the valley and, having risen for a few yards over steep rock, went so closely round the foot of a large boulder that several of the animals had to be unloaded before attempting to pass. From this point there was a steep ascent of some hundreds of feet to the top of a ridge, which we had to cross in order to avoid a waterfall barring our way down the valley. The descent was very steep; at one place it was so narrow and dangerous that the men had to carry the baggage, and prevent the ponies from turning somersaults down the declivity by hanging on to their tails. With care we reached the bottom, which was only a few yards across, and then we began to climb the steep ascent on the other side by means of zig-zag paths. As the caravan slowly mounted, the men and animals in front set in motion numberless stones, which

pelted those who were struggling below. After we had passed the worst part of the gorge, we met the Yuz Bashi of Polu and several of the villagers bringing a large present of delicious melons, peaches, and grapes. Halting and returning the salutations of our friends, we at once showed our full appreciation of the refreshing fruit. I reserved a fair share for my hard-working companions who were behind, and all, as they came up, joined in



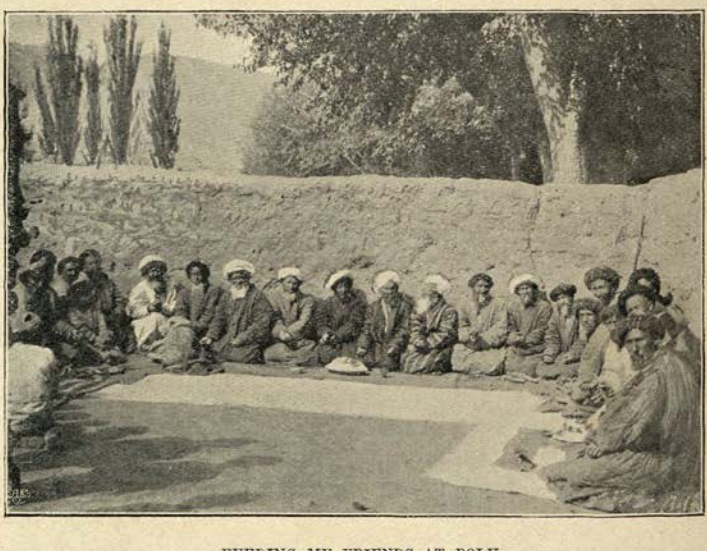
SCENE IN THE POLU GORGE.

praising the fruit. One man who had been lazy and vexatious was, by general consent, left unsupplied, and the spectacle of "virtue rewarded" provoked his keen resentment. From the spot where we rested we had a view of the green hills of the lower part of the valley. After months spent in the desolate regions of Tibet and Aksai Chin a glimpse of vegetation was delightful, and seemed to charm away the anxiety which had oppressed

me. This gladness increased as we advanced and beheld cornfields and trees. At Alajoi we found shelter in a loess cave, and the following day (September 25th), after crossing a country covered with short grass and low plants like boortza, we entered Polu.

Within my three months' absence from this place, several letters had come from the Beg of Polu and Chaka strictly forbidding the villagers to assist me, on pain of severe penalties. When Raju had applied for baggage animals to take supplies to Yepal Ungur, the headmen had met together and after consultation had resolved to disregard the orders of their Beg. A man who had accompanied Raju to Yepal Ungur had, on his return, been arrested, but when it was represented to the Beg that the man was my servant and that I demanded his release, the prisoner was set at liberty without injury to person or purse. When Islam subsequently arrived at the village in quest of forage the Beg sent another letter of remonstrance, which was read to the inhabitants without effect, and a third epistle produced no better result. The Yuz Bashi and villagers who brought the fruit as I was approaching Alajoi, only gave expression to the goodwill with which the people, as distinguished from the officials, of Sin-Chiang everywhere regarded British travellers. I had some difficulty in deciding how to show my appreciation of these various acts of kindness. I had nothing that I could offer them in the form of presents; money would have been inappropriate; I therefore determined, after paying liberally for the forage and hire of animals, to invite the headmen and all who had assisted me to a dinner. Flour, ghee, and rice were obtained in the village; sugar, spices, currants, tea, and other articles were bought from a small trader who happened to be in Polu. I had a couple of fat sheep slaughtered, and on the day after my return I had as excellent a pilau as ever I tasted laid

for my guests, and the number of those who accepted my invitation greatly exceeded my anticipation. The repast was served in the little courtyard of the house I occupied, and in accordance with local etiquette I appeared among the guests, addressed to them a few words of welcome, and tasted the food, which was indeed appetising. The guests did not linger over the repast. The huge portions served to them rapidly disappeared, washed down with



FEEDING MY FRIENDS AT POLU.

many cups of tea, and then the villagers filed out. I was subsequently informed that they not only did justice to the viands, but expressed their kindly appreciation of my motives in providing the feast.

Afraid lest the villagers should get into trouble on my account, I inquired whether I ought to keep silence concerning the assistance they had rendered me, and I was a little surprised to find that they desired no concealment.

If their proceedings were called in question by the Chow-Kuan, they would tell him that they regarded me as his guest, not theirs, and that it was for this reason they had helped me. This view of the matter was in accordance with theory, for in Sin-Chiang I was in fact described as the guest of the Chinese officials, but they no doubt wished me anywhere but within their jurisdiction.

The conduct of Dalbir Rai for the last three months had been very exasperating. He was quite competent to assist me in my observations, but in recording he deliberately made false entries. I had already detected his mis-statements, and had warned him against a repetition of such behaviour, but during this visit to Polu he again wilfully recorded wrongly. I was able to check his work not only by my own notes but also by means of a chronograph, and when I had satisfied myself of his guilt I told him that such conduct was unpardonable. For days he had limped about as if suffering from severe lameness, but now, on retiring from my presence, he at once recovered full use of his limbs. Running to the room which he had shared with Abdul Karim and Dass, he was followed by Raju, who quickly returned to describe the situation of affairs. Dalbir Rai had seated himself in a corner, where, with a drawn hookery by his side and a loaded carbine in his hands, he had command of the door as well as of an aperture in the roof, and threatened death to any one who approached. Abdul Karim and Changfûnchuk repeated the same tale and urged me not to go near him. Peeping through the doorway I saw Dalbir Rai with his carbine pointed at me, and heard his murderous threats. I went and loaded my carbine, an operation which was prolonged by the jamming of the cartridges, but when I returned Abdul, having by promises of intercession persuaded Dalbir to lay aside his

weapons, had seized him and brought him outside, where a large crowd of villagers had collected. Early the next morning I sent Dalbir Rai, under the charge of Raju and an escort provided by the Yuz Bashi, to Kiria. To the Chow-Kuan of Kiria I sent a polite letter informing him of Dalbir Rai's misdeeds, and requesting that he might be sent under escort to Yarkand, there to await Macartney's orders. In my passport all officials are directed to afford me due "protection," and this protection I asked for in view of Dalbir's Rai's threats to kill me.

When this matter was disposed of I went to the plateau, hoping to find antelope, but for two days snow fell continuously, and I had to take shelter in a small cave hollowed out of the loess by shepherds. These caves are difficult to enter, and are so small that they scarcely permit one to move without touching the walls and bringing down showers of loess. When the snow ceased falling, and the haze cleared away, I searched for game but found none, and was glad to return to the comfortable resting-place at Polu.

In these journeys the baggage animals displayed very various powers of endurance. The sheep and donkeys lost far less flesh than did the ponies. The big Yarkand ponies became very thin, and proved quite unsuitable for Tibet. The small ponies purchased in Kashmir and at Gilgit and Yarkand kept in better condition. One of these was of a quarrelsome disposition, and, though generally victorious in his encounters, received on one occasion such a bruising as to require a great deal of attention from me. His nose was badly kicked and the bone broken, one leg was cut, and on another a large abscess was produced. Having on hand also the care of the ponies which had fallen down the mountains-slope near the At To Pass, I found my veterinary practice more extensive than was desirable. My orders that the ponies and donkeys should

be exercised every day greatly surprised both caravan men and villagers, who, regarding such exercise as a good joke, wished to share in the fun. One villager, who had never been on horseback before, mounted a pony which, while merely walking demurely along the track, swerved slightly and unwittingly sent his rider to the ground. The man fell on soft earth but was quite stunned, and the messenger, despatched to the village for help only succeeded in bringing out crowds of woman, who, weeping and wailing, stared at their unconscious kinsman. It was a long time before anything could be got to serve the purpose of a stretcher, but at last the man was carried home, and in a few days he recovered from the effects of his accident.

During my stay at Polu several donkey loads of delicious grapes and peaches were brought from Kiria by small traders, who supplied me and the caravan men with fruit at a cheap rate.

When the Beg heard of my arrival he at once set out from Chaka with a present of fruit for me; but this official had sought to obstruct my progress, and I did not feel at liberty to meet his advances. Declining to accept the fruit, I sent back word by his servant that I refused to see him, and would let him know when it would be convenient to receive his visit, but that, in the meantime, I expected that he would see that my wants were supplied.

By October 3rd (nine days after my arrival at Polu) most of the animals had recovered their strength and I resolved to resume my journey. The Yuz Bashi having promised to house and feed Nurbu, the shepherd, during the winter, I left him to look after the sheep at Polu, and set out for Chaka with the caravan. It was my intention to execute some survey work at that place, but the haze interfered. Reaching Khotan on October 9th, I found

Raju there with Dalbir Rai, who was in bad health. Raju had been ordered to go on quickly to Yarkand to buy ponies, but the Chow-Kuan had detained him to look after Dalbir Rai. After a brief rest I went to the Yamen and requested the Chow-Kuan to send on my letters to the Magistrate of Yarkand, informing him of my purpose to return to that town. The Khotan dignitary promised to comply with my request, and my anxiety on that point was set at rest.

Returning to my quarters, I was visited by three Pathan merchants trading with India. They gave me details of events which had happened at Yarkand since my departure from that town, and which showed the nature of the difficulties with which trade was hampered in that region. I had had in my service for a few months a man named Rastam, a Ladaki, who had asserted (I believe with truth) in the presence of Macartney that he was a British subject. This man had dealings with some Indian traders and, having become their debtor, could not, or would not, make payment. The traders complained to Macartney, who, as the Chinese officials invariably refused to take effective action in such cases, took the law into his own hands. Seizing Rastam's ponies, he had them sold by public auction, and the proceeds handed over to the creditors in part payment of their claims. As soon as Macartney left Yarkand, Rastam took his case to the Chow-Kuan, affirming that he was a Chinese subject, and that his ponies had been sold for much less than their value. The Chow-Kuan ordered the purchasers of the ponies to hand them over for re-sale at the next market, abused the Indian traders for having had recourse to Macartney, and for the attention and courtesy they had shown him, and forbade them to welcome him or any British traveller to Yarkand. Macartney at Kashgar could not undo the Chow-Kuan's work, but on his return to

Yarkand some months later he demanded the fullest apologies from the Chinese magistrate. The Chow-Kuan came, kotowed to him, and at his temporary residence humbly waited his convenience for the discharge of business. Such was the gist of the news I received at Khotan.

The next ten days I spent in travelling to Yarkand, about 220 miles, and there I learned that my letters had only just arrived, and that the Chow-Kuan himself was absent. On foot, I had performed the journey more quickly than the Chinese post.

CHAPTER XIII

Preparations at Yarkand—Fourth attempt to explore valley of Yarkand River—Route followed—Dentistry—The Khandar Dawan—Lying Tajiks—Wacha or Uchi—Reception by Ming Bashi and headmen—Return to Gombaz—Visit from Sher Mohammed—Airy tents—Measuring bases—Fine views of Muz Tagh Ata—Its height—Hard work—Arrival of Ram Singh—Error in longitude of Gombaz—No information obtainable—Start for Mariong—Mariong—No Pamir—False information—Nosh Tung—The Yarkand River—Lying natives—Steep gravel slope—Camp in jungle—Bad track—No route.

AT Yarkand I missed the cheerful companionship of the friends with whom I had become acquainted in the spring; even Mr. Backländ had gone. Dr. Josef Messrur, the Persian missionary, was still here, however, and he bestowed kind attention on Utam Singh, who had much improved in health since leaving Kiria, though he still suffered from an enlarged spleen. I had applied to the Indian Survey Department for an assistant in place of Dalbir Rai, and had been promised a new man, Ram Singh, who was now on the way to join me.

After a few days' rest I gave my time entirely to preparation for the winter journey into Sarikol, a region about which I knew very little. The caravan men were put to the work of oiling yak dans, repairing pack saddles, and making new ones for the ponies and donkeys recently purchased. I laid in supplies of flour, rice, salt, tea, ghee, spices, and (for my own use) a little sugar; horseshoes

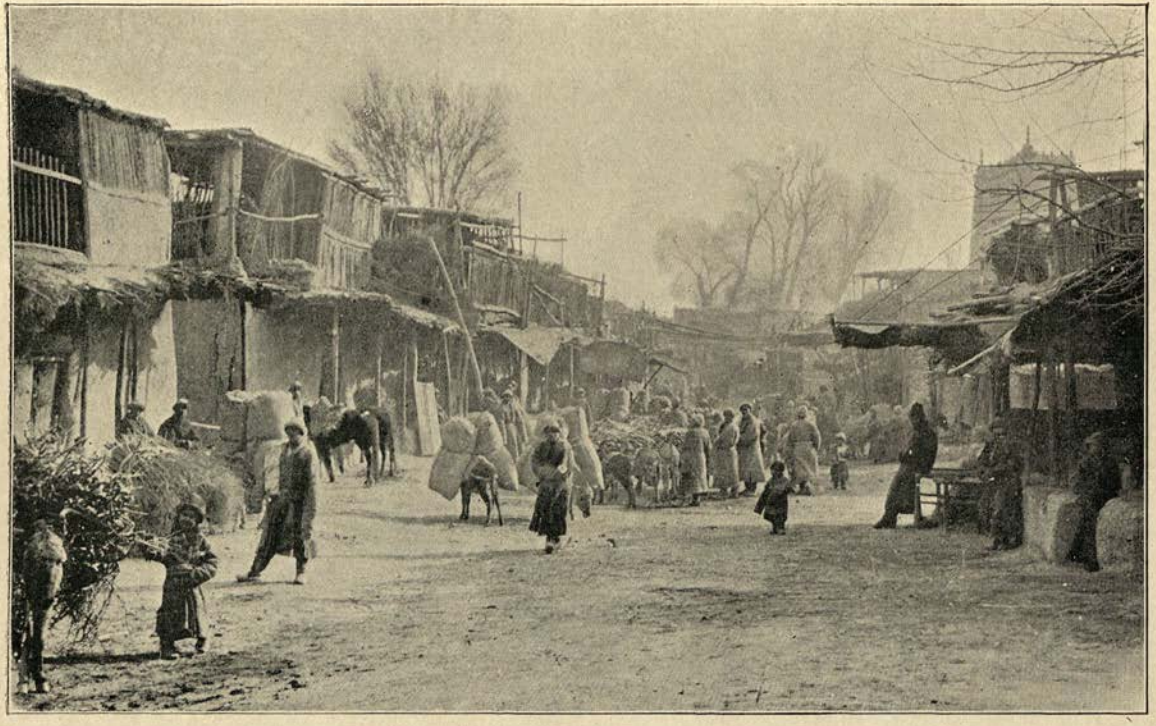
and nails I obtained also in sufficient quantities. The various stores were packed in bags of convenient size, which were put inside larger bags of oiled canvas. The parcels of all descriptions were numbered, weighed, and entered with full particulars in the provisions and stores

TYPES OF YARKANDI WOMEN.

account book. The puttoo and other articles, ordered in April from Kashmir, had not arrived, and it was necessary to fit out the men with garments of local manufacture. Each was provided with a sheepskin coat and cap, a short warm coat and pyjamas made of inferior cloth, but double, and with cotton wool between the folds, a

pair of pepucks or numnah stockings, a pair of long cherooks or native boots, and a pair of gloves. The preparations were simple, but the Oriental propensity to delay made it necessary for me to hurry and bustle to get things ready in time. By adopting this method I had the satisfaction of seeing everything complete and in order, two days before I intended to begin the journey. In bargaining for cash in exchange for bills I found I was no match for the Indian traders. A supply of small change was indispensable, and hitherto I had had no difficulty in finding purchasers for large rupee notes, cheques, and bills on Indian banks. Two Hindus agreed to cash a draft for 1,000 rupees at the rate of 6 tongas 20 dachen per rupee, but before the money was paid Utam Singh told me he could have got 7 tongas 2 dachen, and I found several traders who were willing to accept this rate. My transaction with the Hindus, however, became known, and all other offers were withdrawn, so that there was clearly an understanding among the traders not to spoil the market for each other.

One day when my rooms were in confusion with packing operations, and when I was setting out for a walk, I received an intimation that the Chow-Kuan had returned to Yarkand and was on the way to visit me. This was, of course, intended to be a ceremonious affair, and I had to hasten back to my quarters, order Abdul Karim to tidy my room, and Dass to prepare tea, and then to see that I myself was dressed suitably for the occasion. While I was actually putting on my best clothes the visitor was announced, and I had to hurry to the courtyard to receive him, buttoning and bowing and making profuse apologies for my unreadiness. I did my best to look dignified, but was unsuccessful. My unbuttoned smoking-jacket, knickerbockers unfastened at the knee, braces hanging loose behind, and boots unlaced, amused the retainers of



STREET SCENE IN YARKAND.

the Chow-Kuan, who, nevertheless, took the will for the deed, and, on the whole, seemed to appreciate my efforts to give him a proper reception.

To take Utam Singh into the mountains with me was out of the question, and as he begged for leave to return to Kashmir, I granted his request. I was very doubtful whether he would survive the journey, but he was keen on going, and I made things as smooth for him as I could. Besides funds for expenses by the way, I gave him money to buy a good riding pony and to purchase a share of another pony which would carry his baggage and that of Dalbir Rai. Utam Singh had been very energetic and cheerful while in good health, and had served me faithfully since April, 1896, so that it was with great regret that I parted with him, as he and Dalbir set out together on the route by the Taghdumbash Pamir and Gilgit.

I was now free to set out towards the unknown stretch of the Yarkand River, and the adjacent region between the west end of Raskam and Kosarab. After much consideration I decided to travel by Takla, the Arpatalak Pass, Langar, and the Khandar Pass to the upper part of the Wacha, or Uchi valley. One of my men had crossed the Khandar Pass the preceding winter, and he assured me that from a point in its neighbourhood the Tagh Ata could be seen. I was anxious to observe this peak again, as Colonel Wahab, R.E., had informed me that, having observed the vertical angle in very bad weather, he was doubtful of the height of the mountain. It was the hope of being able to settle all doubt on this question that induced me to choose the Khandar Pass route.

My new assistant had not reached me by the time I was ready to set out, and to save time and trouble I despatched Islam direct to Tashkurghan to meet him, and bring him to my camp in the Wacha valley. This order

may to the reader seem vague, but there was only one direct route from Yarkand to Tashkurghan, and from that place Islam would easily be able to find my position on the west side of the Khandar Pass. In that region, seldom visited by Europeans, the movements of any British traveller are well known, and the tidings of his advance precede him. In order to avoid delay on my return to Yarkand, I arranged that Raju should remain behind to buy ponies for the summer journey into Tibet, animals suitable for travelling in that country being difficult to find; and I engaged a native of Yarkand, Mohammed Yoo by name, to accompany me as temporary caravan bashi.

On November 3rd I set out, and on reaching Takla, the last large village where supplies could be obtained, I added 700 lbs. of Indian corn and 400 lbs. of flour to my stock. As our march was to be over ground not only new to me, but apparently unknown to others, I had no idea how long the journey would take, and it seemed prudent to lay in as abundant supplies as our sacks could hold and our animals carry.

As I went on, I picked up news of the retribution with which the embezzling Yuz Bashi of Oshbeldu had been visited. Tidings of his misdeeds had reached the ears of the Chow-Kuan of Yarkand, who promptly had the offender whacked and then dismissed from office.

After a monotonous journey I reached Langar on November 8th, and found some difficulty in crossing the river. The temperature was still so high that the water was quite free from ice, and though there was a ford a little above the village, it was so deep that all the animals had to swim across. The Beg of Sarikol, who spends part of the year at Tashkurghan and the remainder at Tung, a few miles from the Yarkand River, kindly sent some of his camels to carry the baggage across. The

THE BEG OF SARIKOL AND A GROUP OF TAJIKS.

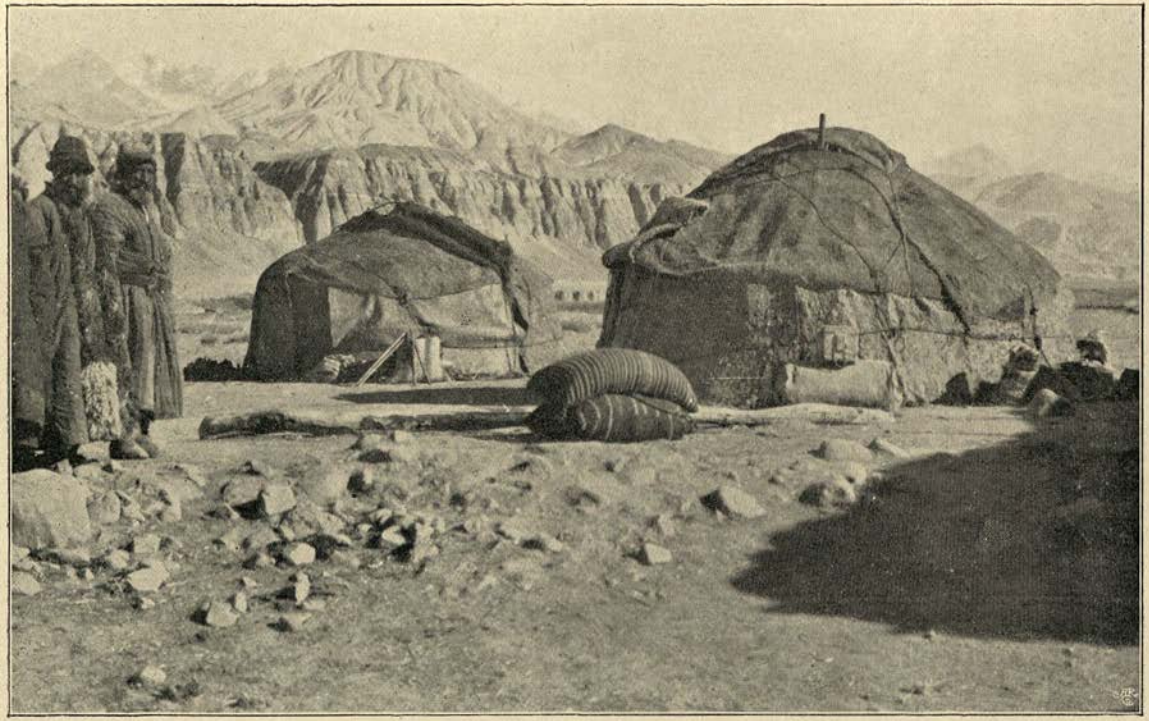
water, though free from ice, was icy cold, and, that the camels might suffer less after repeatedly crossing and re-crossing, it was necessary to delay operations till the sun had mounted the sky. The Beg not only provided camels, but sent his chief assistant with them to conduct me across the ford. This guide would have had to recross the river on the back of a pony, but I was able to dispense with his guidance, and thus spare the faithful henchman a wetting. As soon as I had crossed the river, the Beg welcomed me into his district, and invited me to spend the night at his house. The magistrate's abode I found to be a roomy, comfortable, and well-built house. Entering my room, he took a kneeling and apparently uncomfortable posture, in which he continued while he kept me company in drinking tea and eating chapatties. In the village the caravan men talked freely of my skill in dentistry, and here, as elsewhere, sufferers from toothache came to me for relief.

At Rahbut we spent a night at an "ungur" (or shelter) formed by a huge boulder leaning against the cliff on the left bank of the stream. A small rubble wall, about five feet high, improved the shelter, but the place was still exposed to wind blowing down the valley.

The upper portion of the ascent to the Khandar Pass was very steep and stony, but we had taken the precaution of relieving all the donkeys of their loads, and lightening the burdens of the ponies. Even so, these animals had to be helped over one or two very rocky places, and the loaded yaks, careful and sure-footed though they were, had a good deal of difficulty in scaling the ascent. But, on the whole, we found that Changfûnchuk, in his descriptions of the ground, had grossly exaggerated its dangers. The descent was easy, and as we proceeded the guide, apparently for the purpose of amusing himself and me, poured forth a long series of foolish lies. Turn-

ing to another Tajik, I asked if his whole race were liars, and he, with a solemn face, replied that they were, a remarkably truthful statement to come from the lips of a Tajik.

The ascent and descent took us eight hours and a half, and it was a little after four o'clock when we reached Gombaz, or, as the people on the east side name the place, Mazar. There we found a small, dome-shaped structure, consisting of a single room, and beside it was a small enclosure for cattle or sheep. Soon after my arrival I received the disappointing news from Tashkurghan that Ram Singh had not waited for the arrival of Islam, but had set out for Yarkand. About dusk the Ming Bashi (Head of 1,000), attended by several men, came up the valley with fuel, forage, and a tent. The tent we left unused, and I found shelter in the "gombaz," the entrance to which was such that I had to crawl in on all fours, and have my food passed in as if to a wild animal in his den. The night was cold and comfortless, and I urged the Uchi men to return to their homes, but they remained with me, saying that they were used to the cold, and that they meant to escort me to their village in the morning. They coiled themselves up outside the "gombaz" and slept soundly till daylight, when we set out together. Their company was not cheering; my presence put a restraint upon them, and theirs upon me. They disliked walking, which I much preferred to riding in such circumstances, so I asked them to go on ahead and see that things were ready in the village. The march was short and easy, and at its conclusion we found such comforts as could reasonably be looked for. In a field, close to the Ming Bashi's house, two old tents were pitched, one for me and the other for Dass and Abdul Karim, while for the caravan men there was reserved a hot, stuffy room such as they loved to occupy.



MY CAMP AT KHURAK.

This village, about half a mile from the point where the track to Tashkurghan leaves the valley, is called Khurak. The whole of the valley is commonly known as Wacha by the Tajiks, but is called Uchi by those who speak Turki. For a few miles above and below Khurak the valley is mostly cultivated, but trees are wanting, and on the neighbouring mountains there is no vegetation whatever. While daylight lasted the tents were beset by a crowd of villagers eager to get a glimpse of the strangers. Though they talked and gossiped together, their presence caused no inconvenience, but the noise of the barking and fighting dogs which accompanied them was a great nuisance. Finding no ground at Khurak suitable for triangulation purposes, I returned to Gombaz. The two tents with which the villagers supplied us were so old and ragged that, the minimum thermometer which hung close to my head always showed a temperature within 2° F. of that in the open air. These tents, however, had this advantage over mine, that one could light a fire inside them. Abdul Karim and Dass burned boortza and dung on the ground, while I used a small portable stove, which served its purpose well, its only drawback being the shortness of the flue. This defect was remedied by setting two boxes under the stove, from which the upper was separated by a layer of stones and earth. But for this luxury it would have been impossible to write after dark, as the ink rapidly froze when at a distance from the fire. The alternations of temperature by day and night caused annoyance. At night ink and other liquids froze and burst the bottles, and during the day the melting substances streamed out, soiling and damaging whatever they touched. A little experience taught us never to fill bottles, but to leave room for expansion. Apart from this precaution, vulcanite burst as readily as glass.

From the hill station, about 15,140 feet high, almost

due east of Gombaz, I was able to identify some of the peaks observed the previous winter from the west end of Raskam, as well as Muz Tagh Ata, and another very prominent peak fixed by the Pamir Boundary Commission. I spent a whole day in trying to observe the Raskam peaks from a station on the opposite side of the valley. After struggling through many difficulties I reached, about 4 p.m., a position which appeared suitable, and had the theodolite unpacked and set up, but, to my intense annoyance, I found it impossible to distinguish the pillar I had erected at the first station. The magnetic bearing of this pillar I did not know, and its colour was so similar to that of the mountain-side where it stood, that my prolonged efforts to identify the spot were unsuccessful. It was with vexation that I packed up the instruments, hung them over the back of the yak, and hurried towards the camp, which I did not reach till long after dark. I meant to resume the search next day, but was prevented by a fall of snow, and had to content myself with a lower site, from which I had a good view of Muz Tagh Ata, about sixty miles distant. The bases at the camp formed an equilateral triangle with sides about six miles long, and by means of observations taken from the three angular points, two values were obtained for the height of this majestic mountain, 24,402 feet and 24,403 feet, which agreed very closely with the 24,380 feet obtained the previous winter from a station near Mazar Sultan. These results being considered satisfactory, the Superintendent of the Trigonometrical Branch of the Survey of India determined to accept 24,400 feet as the height of Muz Tagh Ata.

At this camp I anxiously looked for the arrival of Ram Singh. Islam, who had been sent from Yarkand to meet him, had fallen ill, and had been unable to intercept him and shorten his journey. I sent a party of men with

yaks to Rahbut to bring his luggage across the pass, but these men soon consumed their supplies and returned to the camp. A second party succeeded, and Ram Singh arrived when I had nearly completed my observations, for the determination of the heights and positions of the principal peaks within my range of vision. He had had a needlessly long journey, but after a day's rest at Gombaz he set to work. My observing station was at a spot a few score feet above the dome-shaped structure, on fairly level ground. The altitude was 12,230 feet; the position was in 37° 32′ 59″ north latitude, and 75° 45′ 56″ east longitude. The longitude assigned was obtained by triangulation from peaks fixed by the Pamir Boundary Commission. The probable error in longitude does not exceed a few seconds of arc.

At Gombaz I was visited by Munshi Sher Mohammed, who was stationed at Tashkurghan, where he looked after Macartney's fortnightly post between Gilgit and Kashgar. His visit in itself was welcome; the present of fat fowls which he brought with him was most acceptable, and the information he gave me concerning the people by whom I was surrounded was full of interest. I found him an intelligent and instructive companion, and through him I subsequently obtained, also, some information about the inhabitants of the Mariong country (wrongly called the Mariom Pamir).

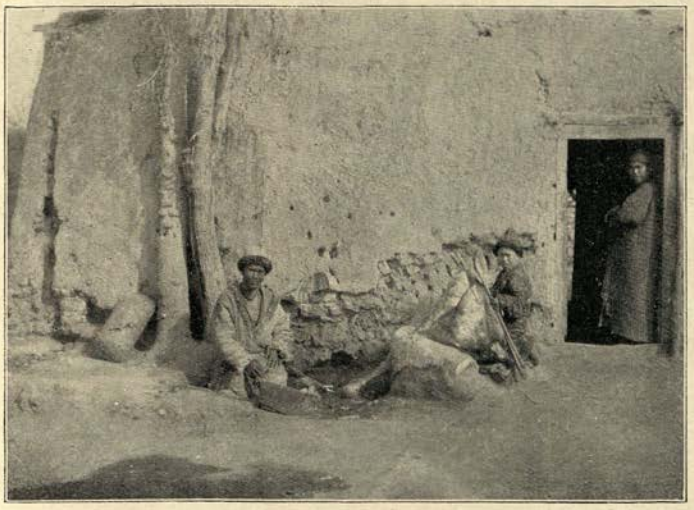
To my regret I was unable to learn anything concerning the route or routes leading towards Raskam or out of Mariong, beyond which I was at a loss how to proceed. The country seemed to be an unknown land, but probably the ignorance which every one professed was assumed in obedience to official instructions. The official method was to obstruct by withholding assistance and information, but I resolved to find out for myself what others would not reveal. That there were routes I had little

doubt, and I resolved to enter Mariong by one route and leave it by another.

On November 28th I returned to Khurak, where I obtained barley and ghee, but no flour. Thence I went by the Thong or Thongal Pass (14,000 feet high) to Mariong. The ascent to the pass was easy, and the descent on the south, though steep, was practicable for laden animals. Mariong village I found to consist of a few houses at the mouth of a narrow valley leading from the Thong Pass. Here the son of the Ming Bashi, representing his father, who was ill, came with several other men from Nosh Tung to meet me, and they escorted me to a large and well-built house. I was the first European who had ever penetrated into this valley, and this fact added zest to my enjoyment of the enterprise. While waiting for the arrival of my little caravan I noticed showers of stones falling down a neighbouring precipice. Looking higher, I saw a large herd of ibex, all small-headed, passing along at a leisurely pace, which they quickened to a run when I discharged my carbine among them. I had often seen ibex on steep places in the Himalayas, but the easy confidence with which these animals passed along the face of crags and precipices apparently presenting no foothold quite astonished me.

The continued reluctance of the people to give any information concerning the country was very vexatious. The Ming Bashi's son would not allow that there was any route leading towards Raskam, and even as to the position of Nosh Tung, the largest village in the Mariong country, the statements conflicted. At one time I was told it was distant one day's journey; at another it was three, and at another two, but, fortunately as it seemed, all agreed that the village stood at the junction of the Mariong and Yarkand Rivers. I continued my journey down the narrow Mariong valley, which was inhabited

and cultivated wherever cultivable. The short stubbles afforded feeding for many coveys of chicore, which Dass and Abdul Karim stalked with very fair success. The valley wound about a good deal, but the route as far as Nosh Tung was good. Having set out at daybreak, I reached this village about four o'clock in the afternoon, but I knew not that it was Nosh Tung. In and about it there was a fair sprinkling of apricot-trees, but the



A NATIVE BLACKSMITH.

interesting fact was that the village did not stand at the junction of the Mariong and Yarkand Rivers. The Ming Bashi, with eyes much inflamed, came out with other men to meet me, and invited me to his house, but I declined to halt. They begged me not to go forward, and when I still went on, the Ming Bashi and another man ran on ahead for a few yards, then, suddenly turning, dropped on their knees and having brought their

heads to the ground implored me not to pass their village. They assured me that the road was bad, the inhabitants few, and supplies almost impossible to obtain. I told them that I was going to Nosh Tung at the junction of the Mariong and Yarkand Rivers, and hurried past them as they asserted that this was Nosh Tung. I had gone some distance and was out of sight of the villagers when I found that I must wait for the caravan. So slow had been the progress of the animals that, in spite of my resolution to proceed, I had to go back and spend the night at the village. This, on the whole, was fortunate, for, as I afterwards found, the track leading down the valley was bad, in some places so bad as to be quite impassable in the dark.

Having made the usual astronomical observations, I renewed my effort to elicit information concerning routes towards Raskam, but again I failed, every one asserting that there were none. Then I informed the Ming Bashi that I was not to be baffled, but that I should remain at the village and draw on its inhabitants for supplies, fuel, and forage till I saw my way to success. In the morning, Ram Singh ascended a commanding peak a little above the Sargon Pass, and obtained a wide view, including many points which had been fixed by me. Accompanied by Abdul Karim and one of the caravan men, who looked after the pony carrying the theodolite, I descended the valley to its junction with that of the Yarkand River. A little below the village we passed a hot spring, the temperature of which was over 130° F., above which point my thermometer was not graduated. Below the springs the valley narrowed almost to a gorge with steep, barren mountains rising on either hand. The river was in some places half frozen ; near its mouth, on both banks, stood trees, apparently half dead ; altogether the country had a dismal look. A little further on the wide and now

clear blue Yarkand River turned sharply to the east, bending, as I subsequently ascertained, in such a manner that it flows for several miles in nearly parallel stretches not far distant from each other. The valley was here very narrow, bounded by the lofty, rugged and barren mountains characteristic of the region, and the way was completely barred by a perfectly vertical cliff. Looking up the Yarkand valley, I noticed a very narrow track leading across a steep gravel slope a good height above the river. Whether this track was formed by men or animals I could not guess, but in either case its course was worth investigating, and I sent Abdul Karim forward to ascertain whether it was such as could be travelled over by lightly-laden ponies. While Abdul was investigating I set up the theodolite and made some useful observations. At night, with Abdul recording, I fixed astronomically the latitude and longitude of this spot, the most westerly point in the course of the river. Abdul's report having been favourable, I resolved to follow his footsteps next morning with a few ponies, and with provisions and corn sufficient to last for three or four days. It might be necessary to cross the Yarkand River, which, even in shallow places, was considered too deep for laden ponies; and, for the purpose of transporting the baggage, the Ming Bashi was induced to supply me with two camels. Of the two camelmen sent with them, however, one was a stranger to the neighbourhood and the other was an idiot.

After we emerged from the Mariong valley the first obstacle was the gravel slope already mentioned, which, though steep, did not stop the advance of the laden animals. The breadth of the track, which at first was but a few inches, was widened by the tread of each pony, and, though the improvement was of short duration owing to the slipping down of more gravel, neither nerve nor

head of man or pony was overtaxed. The descent on the south side was so steep that all the animals had to be unloaded and the baggage carried down by the men, while the ponies, with some assistance, crawled and slid down the slope. The camels, being quite unequal to the labour of crossing the gravel slope, were made to ford the river, and rejoined me further on. The same camelman here informed me that he was a stranger in these parts, but had heard that beyond the first small side-valley, in which there was a stream, grass was nowhere to be found. The general appearance of the country tended to confirm this statement, and I resolved to accept it as true. In the side-valley there was a stream, now frozen over with slippery ice, which the baggage ponies had no little trouble in crossing, and a few score yards up this valley there was a spot large enough, when cleared and levelled, to accommodate two small tents pitched close together. When the ponies were freed from their loads they set out in search of fodder, and, after forcing their way with difficulty through dense jungle, they found some tall, coarse kamish grass containing little nourishment. Early in the morning we were again on the march, Ram Singh and I going ahead of the caravan to reconnoitre beyond the point which Abdul had reached. For some distance we had no difficulty in advancing, but at one place the route was almost impassable. The river was too deep to ford and the ice was too thin to bear the weight of the ponies, while, on the left bank where we were travelling, the rocky mountain-side was so steep that all the loads had to be carried for about two hundred yards by the men, who had also to help the ponies across the steep and slippery incline. A little beyond this place we passed through some abandoned fields in which there was a peculiar tower, probably a former watch-tower, built of rubble on the top of a huge boulder. The name of this

spot was said to be Bu Kujerab. Looking up the valley we saw, in the foreground, only sand, stones, jilgan,* chekundo,† and some half-dead trees, while further on, the lofty, vertical cliffs seemed to draw closer together and completely bar our way. At the foot of the cliffs ran the stream too deep to ford and too thinly frozen to bear even a light man's weight. Beside us not a blade of grass was to be found, though the hungry animals searched diligently. Sonam, with one of the camelmen and both the camels, went to look for a ford, while Ram Singh and I examined the steep left bank in the hope of finding some place where the rocks could be scaled by men. Sonam found a ford, but it was useless, for beyond it the deep river filled the gorge from the one vertical rock to the other so that progress was impossible. Dividing the barley and Indian corn into two feeds, one for the evening and the other for the next morning, we resolved to spend the next day in returning to Nosh Tung. That night we tried to keep our spirits up by the cheery glow of large camp fires of dry wood, which lay about in abundance. But the circumstances were depressing, and I felt the dissatisfaction caused by failure even though only temporary. The position of this camp (No. 126), as determined astronomically, was only about ten miles from my goal, and yet I had to turn back.

Ram Singh was hopeful of finding some accessible and commanding hill to scale on the following morning. I strictly enjoined him to incur no serious risk in the enterprise, but at the same time arranged that one day's supplies, and also extra clothing for the night, should be left for him and another man at the tower of Bu Kujerab.

* A kind of tamarisk.

† *Calligonum polygonoides.* This is largely used for adulterating the tobacco chewed by natives. It is a north-easterly extension of what had been hitherto received only from Egypt, Syria, Persia, Punjab and Scinde.

CHAPTER XIV

Description of valley—Height of mountains—Return to Nosh Tung—Hiring yaks—The Sargon Pass—Dangerous descent—Pichanyart—Grombchefsky's route—Frozen rivers—Jungle—Shamatagle—Difficulty of observing—The Tugadir Pass—Awful track—Meeting with Pil men—Dangerous corner—Pil—No petroleum—Suspicions about me—Unable to descend the valley—Arrival of supplies—Borrowing more money—Departure from Pil—Chadder Tash—Accident to donkey—"Drop" on track—Anxiety about animals—Slow march—Pilipert.

AS we retraced our steps next day we suffered considerable inconvenience from the vagaries of Jack Frost. The Mariong River, three days before, had been easily fordable at a point where now the water was dammed up by ice. The ponies could not wade across, and, as the water was cold and even frozen over with thin ice, the camels would not do so until force was used. Fortunately, we found, lower down, a ford which, though awkwardly situated, was not impassable. We had to clear a path to it through high jungle; on the up-stream side was a deep hole which seemed to have a strange power of attracting the ponies, while on the down-stream side rocks abounded. The ponies were afraid to attempt the passage, and gave much trouble, especially one, which when half across turned and made direct for the deep hole. I tried to put him right by throwing stones, but, unluckily hitting him on the forehead,

brought him down, and with him his rider Guffar, a Ladaki, the fool of the caravan, who was precipitated into deep water. After this accident the prudent course seemed to be to pull the unled ponies across with a rope, an operation which fell to my lot. The rope soon froze in my hands, which became quite numb; my footing on the ice was by no means secure; the projecting rocks, wet by the splashing of the ponies, and quickly frozen over, afforded but treacherous support, and, on the whole, I was glad when this task was finished.

Ram Singh, whom I left behind, made a gallant attempt to reach a point whence a view of the west end of Raskam might be obtained. His efforts deserved success, but failed to command it. Climbing to a point about 5,000 feet higher than Camp 126, according to the aneroid barometer whose reading I had noted before he started, he found that still higher ridges intercepted the view, and it was impossible for him to proceed further.

I had thought it not improbable that I might be able to spend Christmas at Kashgar with Macartney, but had now to face the fact that the exploration of this part of Sarikol would take much longer time than I had supposed. More money and supplies had to be obtained, and I sent Islam to Tashkurghan to borrow money from Munshi Sher Mohammed, and to ask him for assistance in procuring flour, salt, and other articles.

My next route was that which had been at first suggested by the Ming Bashi of Nosh Tung, the point which I had to reach being Pil. My distance from this place I could not find out, but all informants testified to the difficulties of transit. The Sargon Pass, 11,500 feet high, was, as Ram Singh told me, very steep, and, with the passage of it in prospect, I had hired as many good yaks as could be collected, so as to lighten the loads of my own baggage animals.

On December 6th, the day after I had returned from the excursion up the Yarkand River, I crossed the pass, which was clear of snow. The ascent from the Mariong valley was not particularly dangerous, but, on account of its steepness, the animals had to rest at short intervals. Having made a short halt at the top, we began the descent into the V-shaped valley, at the head of which lies Pichanyart. The caravan had to proceed in straggling fashion, down countless zigzags, many of which were very short and steep, though sometimes the longer and easier ones proved dangerous also. On the slope lay numberless stones which, being set in motion by the men and animals in the rear, rolled and bounded down dangerously near those in the front of the caravan. Some of the yak were very troublesome, at times standing stock-still, and at other times rushing from the track for no apparent reason except to loosen showers of stones on the men and animals below. At one part of the descent the risk of injury from this cause was so serious that those above were made to halt till those below had gained a place of safety.

Yak are, as I have already had occasion to observe, very sure-footed, and this valuable quality they retain even when heavily laden and in difficult positions.

The Pichanyart valley was much narrower than the Mariong valley we had just left, and its bottom was covered with jungle, through which the Pichanyart stream forced its way. The village of the same name, where we halted for the first night after leaving Nosh Tung, consisted of a few houses surrounded by some cultivated ground. From inquiries here I learned that there was a direct route from Nosh Tung to the west end of Raskam, practicable for laden animals, and that there was also a mountain track, which only men and goats could use, from a point near Camp 126 to the Pil valley.

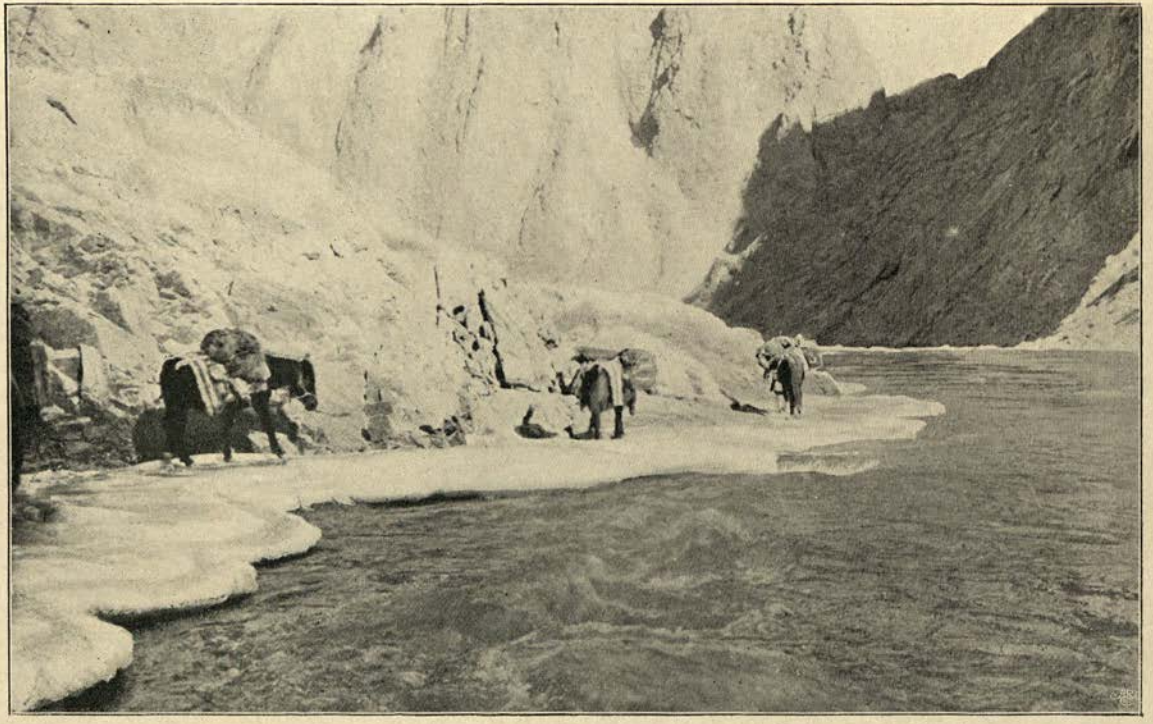
This information was given me in consequence of some bad feeling which the Pichanyart people cherished against the Nosh Tung villagers. Whether it was true or false I could not be certain; but to go back to the Mariong valley, where no more supplies could be obtained, and there renew the search for a route, was out of the question.

Advancing up the small side-valley to the Sharnoz Pass, we found the lower portion beset with jungle and slippery with sloping ice, which at some places had to be roughened before the caravan could proceed. The stream at the bottom was small, but ice overspread the ground to a surprising extent. The pass was easy, and the valley on the east side, though in places troublesome owing to jungle, did not present any very serious difficulty. The village called Sharnoz we found to consist of two deserted houses; its distance in a straight line from the mouth of the Mariong River was only four miles, and yet to reach it we had had to make two marches and cross two mountain passes. From this place we went forward, forcing our way through thick jungle and repeatedly crossing the frozen stream, till after about two hours we reached an open space large enough for our camp. At this spot, called Shamatagle, was some coarse grass, and, though it was not yet noon, the men with the yaks urged me to halt. They knew the route well and asserted that further on, neither grass nor water would be found till we should have crossed two passes, one of which was very difficult. This was annoying, but in such a difficult country it seemed prudent to act on the advice of the guides. The grass here might in summer be sufficient for a few animals, but now the ponies and donkeys, even though hungry, could only nibble at the coarse, straw-like fibres standing in withered tufts. To take observations I went up a steep mountain-side for about 200

feet, and levelled a space large enough for the erection of the theodolite.

From Shamatagle to the pass of the same name the track was at first troublesome for laden animals, but further on it was comparatively easy, though steep, and the pass itself presented no difficulty. From a small eminence close by we had a wide view all round except towards the Khandar range. We could clearly distinguish peaks which I had fixed from Gombaz, as well as those observed from Zad the previous winter; while at two places, several thousands of feet below, we could see the Yarkand River. The site was a most excellent one, and easy of access; the weather was warm, sunny, and calm, and while Ram Singh in comfort accomplished much valuable topographical work, I was able to take several photographs of the mountains which surrounded me in bleak and barren majesty.

The descent from this "specular mount" was for some hundreds of feet delightfully easy. In our immediate neighbourhood the hills showed a fair covering of vegetation on which some herds of sheep and goats were browsing, and there was nothing to remind me of the warnings which the yak-men had given. Soon, however, the face of the country resumed its sterner aspect. We ascended a gentle rise of 100 or 150 feet to the Tugadir Pass, a low gap in a ridge which branched off from the Khandar range, and, looking down, were startled at the change of scenery. So frightfully steep was the descent to the valley, where, several thousands of feet below, we could see the blue Yarkand River winding between bare precipices, that only a few yards of the track were visible in front of us, and had I not been assured by guides familiar with the place, I should not have believed it possible for a pony, even though unladen, to reach the bottom in safety. The caravan had gone



ICE FRINGE ON YARKAND RIVER.

forward without me, and when I saw the dangers of the road I went on as quickly as the nature of the ground would allow, to ascertain how many animals had fallen down the precipice. The path was here a narrow goat-track, and it was obstructed by projecting rocks, but the ponies and donkeys carried little or no baggage, and the laden yak were familiar with the dangers. I have no wish to exaggerate the difficulties of the way, but even now, writing amidst the mountain scenery of Switzerland, I marvel at the skill and daring shown in this descent. At several places the rocks were so steep that the ponies and donkeys had to be helped down by the men, but for whose careful assistance they would have tumbled heels over head to instant death below. All the men worked hard, especially the Ladakis, who, though not in all circumstances ideal companions for the traveller, were always where endurance and faithful labour were required equal to the occasion. In the descent my efforts were devoted to the safety of the caravan, and I regret that I found neither time nor place convenient for the work of photographing the scene; nor could I make good this omission by a sketch, for I have no skill in the use of the pencil. The position, however, of the Tugadir Pass is shown on the accompanying map, with the help of which one may reach a tolerably accurate notion of the general configuration of the country.

It was with a sense of relief that we approached the bed of the river, but even there our troubles were not ended, for steep and rocky ground still lay before us. One such place we were fortunately able to avoid by walking on the ice which extended for some yards from the left bank. Further on, the river was completely frozen over, and the ice proved strong enough to bear the caravan. The ponies, having been with me ever

since I left Gilgit, had profited by experience and were able to walk where walking seemed impossible. They passed safely along execrable tracks, over slippery ice, and down steeply sloping rocks. They had even become proficient in negotiating dangerous drops, and we could with confidence look forward to new feats of pony skill.

Near Sanglash there was a dangerous corner to turn at a spot about 200 feet almost vertically above the river, and I had some anxiety as I watched the progress of the caravan. The yaks, as usual, went first, then one of the men led the quietest and most sure-footed of the ponies, while several other men hung on to his tail to prevent his turning a somersault over the cliffs. The yaks had probably often passed that way and were utterly indifferent to the danger, but some of the ponies showed great fear. The Ladakis thought it better that all except the foremost should be allowed to choose their road unled, and one in terror actually took a more dangerous course, but lengthened experience told in his favour, and he was able to cross without mishap.

When we came within a few miles of Sanglash men from that village met us, and I was glad when I found that they had brought milk for me, for during several days my health had been unsatisfactory, and my diet had been restricted to soup, rice, and tea. The milk was not milk-white, nor so clean as that from an English dairy, but I greedily drank it, for I was exhausted with my arduous march, performed mostly on foot and without solid food. Sanglash village, consisting of three houses and a water-mill, stood about three-quarters of a mile from the Yarkand River, and close to the mouth of a small side-valley. There was some little cultivation in the vicinity, but I saw no traces of jade or of petroleum, nor were the inhabitants acquainted with either, though the region has been credited with both. Having here

obtained sufficient chopped straw and barley, I thought it advisable to rest. Islam had not returned from Tashkurghan with money or supplies; Sonam was ill with fever and buboes under his arm; fresh yaks were required to relieve those from Nosh Tung, and surveying and reconnoitring work had to be done. The caravan had one day's repose, while Stanzin, one of the Ladakis, went to ascertain whether there was sufficient ice on the Yarkand River, below Sanglash, to admit of the advance of the caravan down the valley to Tir. He soon came back to tell us that the ice was quite insufficient, and that the banks were too precipitous both for men and animals. In the evening Islam arrived with money and supplies from Tashkurghan, where the Chinese had become very suspicious of me. Annoying as their suspicions were, I must acknowledge that they were not altogether unreasonable from the Chinese point of view. No Chinaman or, for that matter, no native of the country could understand why a European should voluntarily travel in the depth of winter over the execrable tracks of this inhospitable region. Even the Beg of Sarikol had been inquisitive as to my motives, and when these were explained to him he remained unsatisfied. I mentioned the Royal Geographical Society, and spoke of the great interest manifested by all civilised nations in the rivers, mountains, and general geography of other countries. I explained that many British people were ready to devote their private means to assist in mapping unknown lands, and told him that as the Chinese would not survey this portion of their territory, I had come to do so. I dilated at some length on the love of travel, sport, and adventure which are common amongst the people of the British Islands, but with all my eloquence I could make no impression, and when I had finished he was still sceptical. The mental attitude of the Beg of Sarikol towards me was

not different from that of other official Chinese. These men were ignorant of every nationality except their own; they knew that no Chinaman, no native of Sin-Chiang, would willingly travel as I was travelling, and they attributed to me some mysterious purpose. I was looked upon as a secret agent of the Indian Government, though no suspicion had ever less foundation in fact. I was no agent of the Indian Government, nor even in their service; and there was nothing secret in my proceedings. It was true, however, that while I was in Raskam and adjoining lands the Mir of Hunza was negotiating with the Taotai of Kashgar for permission for the Kanjuts to return to Raskam to cultivate the land. This Kanjut claim was well known on the Taghdumbash Pamir, in the Kulan Urgi valley, and other places; the matter was continually being brought to my notice as if it were of special interest to me, and so sick of the Kanjuts and their claim to Raskam did I become, that I forbade my men to mention either in my hearing. To expect Celestials to discard their suspicions would be tantamount to attributing to them enlightenment and common sense, in both of which blessings they are conspicuously wanting.

As it was impossible to descend the valley of the Yarkand River, we were compelled to ascend the Pil valley. Having paid off the Nosh Tung men, I despatched Islam on a second mission to Tashkurghan for money, making him the bearer of a letter in which I mentioned also Sonam's buboes. The messenger set out with the Nosh Tung men, to accompany them as far as Pichanyart.

One of the most important of the men who came with the fresh yaks was Yul Bash, who had accompanied me the previous winter from Mazar Sultan to Bazar Dara. He had then persistently asserted that he knew nothing of the country between Sanglash and the west end of

Raskam, but he now informed me that he thought he could find a route to the foot of the Topa Dawan. This offer of guidance was tantamount to an acknowledgment that he was acquainted with the country, and I resolved to follow him; but he still, probably to keep up an appearance of ignorance, declined to enlighten me as to the distance or the number of marches required to reach the spot. When it became known that Islam was going to Tashkurghan for money, one of the Sanglash villagers offered to accommodate me with a loan of ten sarrs (about twenty-seven rupees), and when I, in my surprise at the confidence thus shown, asked the man how he expected to be paid, as I did not intend to return to Sanglash, he replied that he was going to Yarkand, where the money might be conveniently repaid, as it would be safer in my hands than in his during the journey. When I suggested that it was possible to repose too much in a stranger, he laughed and assured me that he had entire faith in British Sahibs, and was perfectly certain that he would be repaid in Yarkand. I hesitated to take his offer, but, at last, accepted the money, giving the lender an I.O.U., so that, if any accident happened to me, he might not be a loser.

From inquiries made at various times and places I was pretty certain that no European traveller had ever visited Sanglash except Grombchefsky, who had approached the village from Tashkurghan by way of Pichanyart and the Tugadir Pass, and, without going further east, had returned by the same route.

Our first march up the Pil valley, though quite easy, was very short, as, at the suggestion of Yul Bash and the Yuz Bashi of Dia, we stopped for the night at the small village of Dia in order that we might obtain sufficient supplies for the journey to the west end of Raskam and back. The yak-men, among whom Yul Bash had far more authority than the Yuz Bashi, assured me that by

starting early on the following morning we should be able to reach the top of the pass before night. In these narrow valleys the days were now very short, and the mornings were so very cold that it was impossible to get the men to start early. The slowness of our progress was vexatious, as I was most anxious to finish the exploration of this part of the country before the passes, at all times difficult, should be encumbered with the deep snow which falls in the later part of winter. The only consolation for delay was found in the numerous opportunities with which it provided me, for taking observations and obtaining checks on the work of the topographer, whose task was exceedingly difficult. When, in the morning, Yul Bash and his men were rebuked for the lateness of their start, they replied that it was of little consequence as we should spend the night at a place called Chadder Tash (stone hut), where we should find grass, fuel, and water. The distance to this hut was short, but the way was through jungle which delayed the animals, or over the frozen Pil River, which had to be crossed repeatedly; and at two places the caravan had to halt while the men plied pick and spade (indispensable to the explorer in Sarikol) in clearing a track. On the slippery ice we had to scatter gravel or clay, but here the ponies, habituated to the conditions, showed a marvellous power of keeping their feet, and did not even appear timid or nervous. Up to December 11th, only one pony had fallen on the ice. After six hours of toil we reached Chadder Tash, where we found two miserable huts, but no grass. This desolate spot, visited at other seasons by shepherds and goatherds, who obtained shelter in the draughty hovels, was at this time of the year destitute of fodder, except a little very closely-cropped boortza.* This was useful for fuel, but the hungry animals, freed from their loads, could find no

* *Eurotia ceratoides.*—C. A. M.

sustenance in it, and as they wandered about in search of something edible had at least the benefit of exercise in the frosty night. It would have been easy to bring chopped straw from Dia had I known the true state of matters, but now it was too late to send for it; expostulation with the guide was useless, and I had simply to submit to the habitual practice of falsehood on the part of those to whom I looked for information. Snow fell during the night and overspread the fine clay with which the track in many places was covered. When we started in the morning I went on ahead as usual to examine the track, but before I had gone far was recalled by the shouting, which told me that one of the animals had fallen. The fresh snow, mixed with the underlying clay, had balled in the feet of the ponies and donkeys, and it was with the utmost difficulty that the animals could walk or even stand. To this cause of trouble the caravan men had paid not the slightest attention, and one of the donkeys, moving along a comparatively excellent track nearly eight inches wide, had slipped and fallen down the declivity. The donkey was killed by the fall, but his load sustained little damage, only one tin of Bovril having been destroyed. The temperature was very low, and the clay-snow mixture froze so hard that the hacking of it out of the hoofs with knives on the narrow track was both difficult and dangerous. Though the famished animals became restive and resented the operation, the task was accomplished, and by sending the yaks ahead we had the path trodden and cleared of snow, so that this source of trouble disappeared almost entirely.

Having climbed a steep but not very difficult ascent of 300 or 400 feet, we came to a very vile piece of ground. The narrow track was steep, rather a drop than merely a descent, beset with protruding rocks and strewn with loose stones, large and small. We worked with picks,

somewhat smoothing down the rocks, and we rolled the larger stones over the declivity, down which they bounded to the bottom. We thus slightly improved the track, but to make it even tolerably free from danger within the time at our disposal was hopeless. There still remained large projecting rocks which blocked the way for animals laden with bulky packages, and when we resumed our march the greatest care and caution had to be exercised. The yaks were sent on in front laden with corn, flour, and rice, each of them assisted by several men, who led, urged, or restrained according to circumstances, while others hung on to the tail to prevent the animals from turning heels over head down the declivity. The yak dans, containing instruments, bedding, clothes, cooking utensils, and medicine chest, were carried by men who returned to help the unladen ponies and donkeys down the slope. The men managed so well that there was no serious casualty. Any mishaps that occurred were due mainly to the awkwardness of the donkeys. These animals were sent down in lots, and the last donkey of the foremost lot, losing his balance, fell and slid, sweeping off their feet many of those in front. These poor animals seemed quite to lose their wits, sliding and rolling down in the most alarming manner. Any deviation from the track would have led to certain death, and it was marvellous that not one was killed. There was very considerable annoyance and danger from stones loosened by the donkeys in their fall. One large stone had just begun its descent towards the lower portion of the caravan when it was dexterously intercepted by Abdul Karim, who, taking a few long and quick strides, stepped across its course and stopped it, but in so doing had his right hand dragged along the ground and badly bruised. It has been my fate to take a caravan over so many bad tracks, that it would be difficult to arrange them definitely in order

of demerit, but this execrable drop, or "chute," if not absolutely the worst descent I ever became acquainted with, was certainly surpassed in vileness by none.

About four o'clock in the afternoon we reached the two stone huts of Pilipert, whose distance in a straight line from Chadder Tash did not exceed four miles. The caravan, consisting of a few yaks, ponies, and donkeys, with men in sufficient numbers to render all assistance that could be given, had taken nearly eight hours to the march.

One of the small flat-roofed huts, through the walls of which the biting wind blew as easily as through a sieve, was occupied by a few men in charge of about sixty yak, the herd being brought every winter to graze. The place was 13,850 feet high, but possessed abundant grass. At this spot we found that four routes met—viz., that by which we had just travelled, one leading from Kulan Urgi, and a third and fourth to the west end of Raskam. During the evening there was unusual excitement and hubbub among the yak-men while they discussed among themselves the choice of my next route. Their opinions and counsels were divided, but I was too busy with my observations and computations to pay any attention to them, and when my work was completed quiet had been restored in the company.

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CHAPTER XV

Yul Bash—Guides entrapped—Ascent up glacier—The Mamakul Pass—Trying observations—Exposure—The descent—Zambôk frozen to death—Long march—Travelling in the dark—Misgan—Difficult march—Raskam—Lazy yak-men—Object accomplished—Lengthy *détour*—Precipitous ascent to Topa Dawan—Good news—Yul Bash the liar—Accident to yak—Return route—Tents useless—Ram Singh does good work—Natives refuse information—Paying off the yak-men—Issok Bulok Agzi.

WITH two routes open to the west end of Raskam, and with guides in my company evidently well acquainted with both, I seemed to have a fair chance of reaching my goal. Of the routes I knew nothing, and between them I could make no choice, while, as to the guides, I quite understood that truth-speaking was not among their accomplishments. However, though Yul Bash, a man of marked individuality, persistently disclaimed all knowledge of both routes, I put myself with some confidence in his hands, believing that, for reasons of his own, he was understating his qualifications. A company of Kirghiz had set out the day before on the route up the valley, and had crossed the high pass at its head, and this route Yul Bash urged me to follow. I had had experience of this man's falsehood, but knew no other reason why I should not in this matter take his advice; so I prepared to set out in the morning. Round Pilipert the country was free from snow, but up the

valley we could see that the ground was white and evidently impassable for ponies and donkeys. I therefore resolved to send the greater part of the caravan, comprising most of the men, all the ponies and donkeys, and all the spare baggage and food, to the Kulan Urgi valley to wait as near Issok Su Agzi as the supply of grass in the neighbourhood would allow, while Ram Singh and I, accompanied by Abdul Karim, Dass, Mohammed Joo, and Sonam, under the direction of the yak-men, would follow the track of the Kirghiz. The yak were six in number, and these were represented as sufficient to carry the two tents (which on the journey proved only burdensome, not useful), the instruments, the bedding, food, cooking utensils, and, as the weather was very severe, an abundant stock of clothing and rugs. In the evening, seated at my tent door, with the thermometer at about 0° F., I found it necessary to labour at my computations, consulting logarithmic tables and the Nautical Almanac, and at the same time to superintend the weighing of the packages and the issuing of rations for the separate travelling parties. When these various duties had been accomplished, and when I had given instructions for next morning to Yul Bash and the yak-men from Dia, I was able to turn into my tent, and tie myself in my sleeping-bag for a good night's rest.

Next morning I was early astir, but the air was cold and raw, the temperature at seven o'clock being under 0° F., and the day was well advanced before we set out. The snow in the open was not more than six inches deep, and the tracks of the Kirghiz were easy to follow. This company consisted, as I was now told, of men who were attending Tahir Beg, the chief interpreter of the Chow-Kuan of Yarkand, on an official mission to Raskam, and the rumour was current that Tahir Beg was going to point out to the three envoys of the Mir of Munza the

places which their countrymen, the Kanjuts, might occupy. I had, of course, no connection with the Kanjuts, but it was unfortunate that my journey to Raskam should be made in the track of the Chow-Kuan's interpreter, for neither Chinese nor Sarikolis would regard the coincidence as accidental.

For several miles the ascent of the Pil valley was not steep, and the track was fairly good, so that I had leisure to question the yak-men concerning the route. Taking them individually, each out of earshot of his comrades, I found that the men were in fact well acquainted with the route. Two of them became so frank as to point out the direction of the Mamakul Pass which we had to cross, but perceiving that they had committed themselves in displaying their knowledge, they became sulky, and sullenly insisted that they did not know, but only thought that the matter was as they had stated.

The ascent became steeper and the track more stony until it was concealed under snow-drift, frozen so hard as to support the yaks, which, however, occasionally broke through the upper crust. The little valley where this snow lay was fairly well sheltered, but when we passed beyond it we had to scramble up the ascent on a slippery glacier with a strong wind in our faces, while the temperature was at $-8°$ F., or forty degrees below the freezing-point. The gradient was rather steep, the ice very slippery, the air highly rarefied, and the yaks heavily laden, so that rapid progress was impossible and frequent halts were necessary, that men and animals might regain their breath. Owing to the slowness of the motion and the frequency of the stoppages the cold was very trying, especially for the feet. I was warmly clad, but exercise was necessary to prevent stagnation of the blood. My socks were not in the best condition, but they were of the thickest wool, and even three pairs together could not

keep my feet warm as I crawled up the glacier. Ordinary boots, under the conditions of this ascent, would have been worse than useless, but I found much advantage in wearing my old rubber-soled boots. For a little while after being put on they were cold, owing to the frozen moisture they contained, but as this thawed they became warm and comfortable; the rubber soles rendered my footing on the ice secure, and they wore well. It was not till about half-past three that we reached the top of the Mamakul Pass, where, somehow, the wind was less violent than in the ascent, and the bright sunshine raised the temperature a few degrees. Taking a hopeful view of the situation, I set to work to boil thermometers and ascertain the height of the pass, but the operation proved exceedingly trying. In order to handle the hypsometer more easily and to light the candle, which was sheltered from the stiff breeze by Abdul Karim's and Mohammed Joo's coat-tails, I removed my thick gloves and my fingers repeatedly became numb. The cold was so intense, and the wax of the candle was frozen so hard, that the heat emitted by the three wicks, whose tips, after a vast expenditure of vestas, I succeeded in lighting, was unable to melt it, and we had to pile little pieces of old candle ends round the tiny flames till the wax began to melt and the metal work to become warmer. When the candle was properly lighted our troubles in this operation were ended, for the hypsometer was so well designed by Casella that no wind ever blew it out. While the ice was melting I ran about and stamped my feet to keep my blood in motion and prevent frost-bite, and as soon as the water boiled I made my notes, packed up the instrument, and began the descent. To attempt topographic work in such circumstances was out of the question; but we were able later to ascertain the position of the pass and lay it down accurately on the map. To me, though

I was, except for a few minutes, completely equipped against the cold, the conditions here were very trying, and I could not but marvel at the hardiness displayed by the yak-men. They were by no means overburdened with raiment, and not one of them wore gloves, yet they seemed to suffer no injury and almost no inconvenience from exposure to the biting wind. Among them was a mere boy, who usually led the foremost yak. He wore no gloves, and his clothes were in a wretched condition; yet he seldom spoke, never complained, and never appeared even to be fatigued. Natural selection would, of course, go a long way to account for the power of endurance shown by these mountaineers; the men who were not fit for the climate would die off and leave possession to those that were; but the cheerful, uncomplaining industry exhibited by the boy appeared to spring from virtues which he shared with none of the others, and which were very pleasing to contemplate.

The descent on the Raskam side of the pass, being exposed to the sunshine, was quite free from snow, and the one glacier which we noticed on our left hand as we descended was small but steep. At first the declivity was steep and covered with shale and loose stones, on which Ram Singh and Mohammed Joo, who led the way, were unable to keep an upright position. By keeping the yaks pretty close to one track, however, we improved the road and I was able to descend without much trouble; but so difficult was the ground that four of the six yak slipped and fell.

Nearly a year before, when at Yarkand, I had bought a thick-coated dog, Zambôk by name, which though of a very independent disposition had become quite attached to me. His custom was to sleep in my tent and to enliven the night by rushing out to bark at the animals or at sounds which were to me inaudible. His love of the chase

was unbounded, and if at liberty when within reach of four-footed game he could not be restrained. His sporting proclivities had been annoying in Tibet and Aksai Chin, for he often scented or saw antelopes and was off in pursuit before we had even suspected their presence in the neighbourhood. To have a chance of getting near game we found it necessary to tie him up and lead him, but he soon became expert in eluding us. He used to slink away early in the morning and, keeping at several hundred yards' distance from the camp or caravan, would listen to no commands or coaxings or promises which were intended to bring him back. If he found no game on the march he would still keep his distance till camp was pitched and then would cautiously rejoin us. Zambôk had been in our company when we set out from Chadder Tash towards Pilipert; our slow progress had annoyed him, for he went forward and returned repeatedly to ascertain what was wrong. He bounded away again, satisfied each time with being patted on the head, but from one excursion he never came back. When our company had got past the shaly, stony declivity on the way to Raskam, Abdul Karim, who was a short distance ahead, shouted to me that he had found Zambôk frozen to death. The dog had seen or scented far off a herd of ibex or burrhel and, promptly giving chase, had pursued the game across the Mamakul Pass and over the steep glacier, where he had slipped and fallen, breaking a leg on the rocks below. I was not the only member of the caravan that lamented his decease, for Zambôk, with his close-cropped ears, had a fierce and threatening appearance which made him a valuable watch-dog, his mere look frightening away natives who were disposed to pay us troublesome visits.

When the daylight began to wane we were still high up in a region destitute of shelter, of fuel, and even of ice, and though men and animals were hungry, thirsty,

and tired, it was necessary to hasten forward. None but the yak-men knew where we should be able to halt for the night, and they would not tell, so, directing them to make no delay, I went ahead to reconnoitre. The valley presented a cheerless aspect; it was exceedingly rocky; in places it was so steep as to be almost impassable even for the yaks; no water was in sight, and no fuel of any sort. Being anxious to see as far forward as possible before daylight quite failed, I pushed on and, much to my surprise, came suddenly on a herd of burrhel which had come down to the valley to quench their thirst by licking the ice. Unfortunately, I had left my carbine behind, and could only continue my solitary tramp. After marching in the dark for about two hours in an unknown region, stumbling over rocks and stones, I threw myself on the ground to wait for the arrival of the caravan. Yul Bash was the first to reach me; then Mohammed Joo, who told me that, notwithstanding his professed ignorance, Yul Bash knew of an "ungur," or shelter, a little further on. I was hungry, thirsty, and tired; the level plot where I was contained room enough for the purpose of sleep, and there was some brushwood at hand which would serve for fuel; so I declined to go forward till Yul Bash stated plainly that he knew the ground. Then, sending our guide in front, I stumbled on, and at length heard him explain that he had reached the "ungur." The tired men and yaks struggled in and were relieved of their burdens, and, after lighting a small fire of brushwood, we were able to look about us. Rocks and stones were too plentiful on both sides of the valley, which was hemmed in by barren and almost vertical mountains; but we plainly heard the sound of running water; some low bushes, fit for firewood, were close by, and there was a prospect of finding sufficient level ground to sleep on. I asked Yul Bash where the "ungur" was, and he replied

triumphantly, "Of course, Sahib, there it is," pointing to a semicircular wall of rubble, not more than eighteen inches high at its highest parts, but supposed to be completed by a slightly overhanging cliff of solid rock. Dass immediately took possession of this so-called "shelter," while others stretched their weary limbs on the ground for a few minutes' rest before setting about the preparation for the night's repose. Then lanterns were lighted; Yul Bash and two companions went to gather firewood, and I looked about to select a suitable spot for my quarters for the night. Close to the "ungur" there was another shelter, formed by projecting rocks, and as this was supposed to be the most desirable spot which the locality possessed, I promptly claimed it for myself. It was in fact not one whit better than the open ground, but the natives considered it superior, and had I not occupied it I should have fallen in their estimation, and have thus prepared trouble in the future. Our long and toilsome day's labour came to an end about 9.30 o'clock, when Ram Singh, Abdul Karim, and Dass, as well as myself, enjoyed a hastily prepared but well-earned supper. Then I had time to deliberate on the annoyances of the day. If Yul Bash, who knew the route and the distance perfectly, had informed me of them (instead of protesting his ignorance) we should have started earlier; we should have carried less baggage, for our tents might, with much advantage, have been left at Pilipert, and we could have obtained more yaks. But Yul Bash loved to keep his information to himself, and, in a curious way, to pose as a man of mystery. For the determination of the position of our bivouac I was too tired to take astronomical observations, which high and almost vertical cliffs and the winding of the valley would have rendered somewhat difficult. I made preparation for rest, lengthening the "shelter" according to the measure of my own stature, and I was

soon snug within my sleeping-bag, only my face being exposed to the freezing air.

Awaking at daybreak from sound and comfortable sleep, I found that the thermometer which hung at my head indicated a temperature of zero F. Proceeding to rouse the caravan, I urged the men to get ready for the journey without delay, but it was late in the forenoon when we resumed our march. In the short distance to Misgan we had no trouble, and there we found a couple of Kirghiz from the Tashkurghan Pamir. These people, in accordance with the habits of the region, professed utter ignorance of the distance to the Yarkand River. Passing their tent, we followed a very crooked track in and out of dense jungle, and beset in places with projecting rocks. The jungle impeded the yaks, while both jungle and rocks severely damaged the baggage, but before darkness had quite fallen we had reached a more open part of the valley. There we found some abandoned houses and fields, and, about a couple of hundred yards further down, was a side-valley up which another route branched. I had hoped to reach the Yarkand River that night, but the yaks were so tired and the way so bad that it would have been unreasonable to have insisted on pushing on. A fairly large ruined house offered shelter for us all, and we were cheered by the blaze of thick, dry wood which we found in abundance. A few hundred yards from the place where we were bivouacking we had passed several heaps of chopped straw, yet the yak-men had no intention of supplying their animals with fodder, till I threatened pains and penalties to those who did not either bring the food to the yaks or take the yaks to the food. After a late repast I unpacked the instruments and had them carried to the small side-valley, where the usual observations were taken. At the bivouac I was informed, to my surprise, that this valley, from Misgan downwards, formed part of

Raskam, and that the Kanjuts were to be allowed to settle there and cultivate the ground. Another interesting fact communicated to me was that, so recently as the preceding summer, the land round our bivouac had been cultivated by Yul Bash. This information was obtained by Mohammed Joo from a yak-driver boy. This lad was not a Tajik but a native of Kulan Urgi, and, as he was evidently disposed to give information, I instructed Mohammed Joo to entrust my riding yak to his care.

We were in no hurry to start in the morning, as we knew we were only a few miles from the Yarkand River, and thus the yaks had ample time for a full feed. I set out before the rest of the company, and when Mohammed Joo and the boy overtook me I began to question the latter. He stated that Yul Bash was intimately acquainted with the whole of this region, and he described to me an easier route to Pilipert than that by which we had travelled from that place. This new route lay up the side-valley we had seen near our last bivouac; it presented no difficulty on account of jungle, or the absence of water or of fuel, and if we travelled by this route four days would be sufficient for the return journey.

I had hoped to find the lower part of the Misgan valley fairly easy, but in this I was disappointed. In many places the jungle was very dense, and when the baggage reached the camp on the right bank of the Yarkand River, about a mile below the Misgan valley, it had a sorry appearance. The bags containing my bedding, my clothes, and the men's kit were literally in ribbons with their contents protruding, while the yak dans and the mule trunk were scratched and torn. These incidents, however, were but trifles now that I was camping at my goal. This spot, 37° 2′ north latitude, was only about twelve miles from Camp 126, yet to reach it I had marched for ten days, had covered most execrable

country, and had crossed five passes, one of which was about 16,550 feet high. Our camp (137) was pleasantly situated at an open part of the valley, where we found abundance of good dry driftwood and, not far off, a little kamish grass. It was necessary to halt for a day to rest the tired yaks and to await the arrival of some fresh ones. In my sunny quarters I spent the time mainly in checking

LOOKING DOWN THE VALLEY OF THE YARKAND RIVER FROM THE MOUTH OF THE MISGAN JILGA.

the errors of the chronometers by means of a system of latitudes and an azimuth of about 180° to the pillar erected in the previous winter close to the Topa Dawan. Ram Singh spent the day profitably in sketching, and the yak-men roughly repaired the much-injured baggage.

To determine the thickness of the ice on the Yarkand River, which, under the high vertical bank close to the mouth of the Misgan Jilga, was nearly frozen across, I

made two holes in the ice. The first, about 20 feet from the bank, showed ice 20 inches thick; the second, in mid-stream, showed ice about 6 inches thick but covered with frozen snow about 6 inches in depth. When the holes were made there was an escape of air which, from the noise it made, appeared to have been under considerable pressure, probably slightly increased by my weight on the ice.

The man who had been sent for fresh yak returned in the afternoon with four animals, and Yul Bash had an opportunity either to offer or to decline to lead us back to Pilipert by another route. Without telling him how much I knew, I questioned Yul about the proposed route, and found that his replies were repetitions of the statements made by the boy. We all looked forward with much pleasure to the return journey, for the four marches which it would require and the four passes which would have to be crossed seemed easy compared with the labour we had undergone during our ten days' journey hither. Mohammed Joo went so far as to say that, if we returned by the old route, the baggage would vanish piece-meal before the journey's end. It was satisfactory also that neither Ram Singh nor I would have to ascend to the Topa Dawan by the steep track, which seemed to be similar to the descent from the Tugadir Pass to Sanglash. How Tahir Beg and the Kirghiz contrived to get their animals up the track to the Topa Dawan I do not know, but, as no dead bodies were found below in the jungle, it is reasonable to infer that they succeeded.

From Camp 137 we noticed, on the opposite bank of the river, a well-marked track leading probably to Mazar Sultan by way of the Ushdir Pass, which was said to be good. This track doubtless came from the head of the Mariong valley. The track on the right bank, according to Yul Bash, led to Pil, and was practicable only for

ponies; but, according to a further statement (probably true) elicited by questioning the same authority, the track is possible also for a yak.

Leaving the Misgan Jilga a little below Camp 136, we turned up the Yurzanuk valley, where in some places the jungle was very dense and troublesome. Under the tall, thick grass there was hidden a very narrow and dry watercourse, into which one of the yaks fell. The animal dropped almost entirely out of sight, only his head and the load he carried remaining visible. The banks were so close together that he could scarcely move, and it was with great difficulty that he could be lifted. All the men were required to bear a hand, and at length, after much expenditure of labour and of native oaths, the yak was set on his feet on the bank. Our first day's march was short, for we considered it prudent to camp at a spot where grass, fuel, and water were found in sufficient quantities, though the spring which supplied the water was frozen almost solid, and the camping-ground was so narrow that it did not contain level ground enough for one tent.

The men were now apparently desirous of reaching home, and gave no trouble when I urged them to start early in the morning. We were still on ground familiar to the yak-men, one of whom, though persistently disclaiming all knowledge of the country, had his home only four miles up the valley from Camp 138. There he lived in company with some shepherds from Dia, one of whom was uncle to Yul Bash, and their winter encampment of two wretched huts in the midst of a scene of desolation was like a picture of forlorn misery. Even fuel and grass were scarce, and, as there was no stream or spring within four miles, they had to obtain water from melted snow.

From a peak slightly higher than the Yurzanuk Pass a wide view was obtained, embracing some of the peaks already fixed, and Ram Singh was able to sketch a good

deal of country, while I rendered assistance by determining astronomically the positions of the camps in the deep, narrow, stony valleys. In the valley below Camp 139 we saw many yak, which, I was told, belonged to Mariong people and were left unwatched during the winter. The men affirmed also that the track leading down the valley to Mariong was practicable only for men, but this statement was scarcely credible, for it was improbable that the Mariong people would take their herds by a route so circuitous as that by Sanglash and Pilipert.

Soon after leaving Camp 139 we encountered a steep ascent of 2,400 feet to the top of the Furzanuk Pass, which, with its narrow and precipitous zigzag tracks, seen from the opposite side of the valley, appeared practicable for no animals larger than sheep or goats. On closer acquaintance, however, the ground proved not so very difficult. From this pass, 14,800 feet, we had to descend into a valley where several yak were grazing, and thence to ascend about 700 feet to the Yetin Kozay Pass. The topographic work in this neighbourhood was important, and, though the temperature was very low, Ram Singh manfully continued his sketching without suffering from frost-bite.

Setting out from Camp 140 at eight o'clock in the morning for the last day's march to Pilipert, we experienced some inconvenience from the very fine snow which then began to fall, and which froze on my head and moustache, and even on my eyelashes. At the top of Adam Tuamos Pass, 16,050 feet, where the temperature was about -4° F., or thirty-six degrees below the freezing-point, and a strong wind was blowing, we boiled thermometers. There was some little shelter from the wind, but, nevertheless, my feet became cold very rapidly, for my woollen socks were so torn and worn and patched and mended, that they were little better than mere

remnants of their former selves. The descent to Pilipert was not steep, but was stony and slippery from the new-fallen snow. Early in the afternoon we reached Pilipert, and I was cheered by the sight of a supply of firewood outside one of the stone huts. This firewood indicated more than fuel, for I had instructed the men who took the ponies and donkeys to the Kulan Urgi valley to urge my friends among the Kirghiz at Zad, to send to this place two loads of wood and also several yaks to carry my baggage into their valley. On reaching Pilipert my appearance was like that of Father Christmas, for, to say nothing of my clothes, my beard and moustache were white with snow and fringed with icicles. Entering the only unoccupied stone hut, I seated myself on the ground before a large fire and, though the cold wind easily penetrated the roughly-built walls and chilled the side of my body which happened to be turned away from the fire, I soon cleared my visage and prepared for work. The cloudy, snowy weather was inauspicious, but nevertheless, being desirous of making observations for rating purposes, I unpacked the theodolite and waited patiently for the sun to shine forth in his brightness. That orb, however, sank in obscurity behind the mountain-tops, and, chilled and disappointed, I turned in to dinner. Of that repast I partook in comparative comfort, with a kit-bag for a chair, my knees for a table, and the caravan men scattered about in various attitudes for company. The dining-hut was draughty with freezing currents of air, but on the whole the conditions were satisfactory, and my equanimity was restored. Going outside again, I saw the shining stars, made the necessary observations and computations, and then with a mind at ease had a bright fire lighted in front of my tent so that I might enjoy its cheerful glow. Among my stores I found supplies suitable to the occasion, and, sitting on the

ground at my tent door, warming my toes at the fire and my inner man with hot grog, which, of course, I shared with others, I listened to the results of inquiries concerning our future course. Mohammed Joo, a wily native of Sin-Chiang, thoroughly acquainted with the people, had been instructed to offer a large reward in money for information concerning the routes in this mountainous region. He now squatted beside me and, sheltered from the cold wind by the tent door, told me what success had followed his efforts. The sum of his news was simply this—that he had got none. Once he had seemed on the point of obtaining information from a Tajik yak-man, but the conversation had been overheard by another Tajik, who promptly ordered his compatriot to hold his peace. Tajiks, from my own sad experience, I knew to be liars, but these yak-men were remarkably true to one another. Evidently there was a compact amongst them, and not even the temptation of a large reward induced them to describe, or even to mention, the direct route from Mariong to the west end of Raskam. Such information as I obtained came from the yak-driver boy, who was not a Tajik. Next morning I had to clear up and settle accounts with the Tajiks, and this I did before the blazing fire while waiting for the Kirghiz to load their yaks. The one debt indisputably due was for the hire of the yaks and yak-men, but besides this I was at liberty to take into account the services which had been rendered by the men individually. On ascertaining the owners and the amount to be paid for the use of the animals, I was surprised to find that not one of the yaks belonged to Yul Bash, who till that moment had asserted that he had supplied several of them. I paid to each owner the full amount due, at the full rate, giving no gratuity, and then handed to the boy, as backsheesh, a sum of money sufficient to purchase two goats. It had

been the boy's ambition to become the owner of two goats, and he was more than satisfied with his reward, which, as I explained to the men, was bestowed because he had always been helpful, and never troublesome. I referred to the hardships and delay to which we had been subjected by the stubbornness and falsehood of the men, to whom I would give no backsheesh, but I acknowledged some little indebtedness to Yul Bash for his guidance from Dia to Pilipert. Yul Bash looked with scorn at the pittance I gave him for that service, and asserted with great volubility that he had been my guide to Raskam and back. When he had finished his protestations I reminded him that he had not guided me at all during the journey from Pilipert to Raskam and back; that he had persistently asserted that he knew nothing of the country and nothing of the route to the Yarkand River, which I had discovered for myself. Admitting that there was some truth in this, he still claimed to have told me of the return route; but here again he was confronted with his own statement, for he had told me that he only knew of that route from information supplied by the men who brought the fresh yaks to Camp 137. Yul Bash had strength of character and force of will; he was well able to play his own game, and it would have been mere softness on my part to give him or the men he influenced any gratuity after the privations and toil which had resulted from their conduct.

It was without regret that I set out from Pilipert for the more genial climate of Kulan Urgi, where I was sure of a favourable reception at the hands of my friends the Kirghiz. One day's march had to take me as far as Issok Bulok Agzi, and, with two passes to cross, it was necessary to move at a steady pace. The Piyek Pass, about 16,000 feet, presented a fairly gradual though very stony ascent, and from its top we obtained an excellent view

not only of the lofty, snow-clad range separating Raskam from the Kulan Urgi valley, but also of the lofty peaks near the Kukalung Pass and of the range on the north-eastern side of the Kulan Urgi valley. By ascending a low peak close to the pass, Ram Singh was able to see mountains far distant in other directions, and easily identified Muz Tagh Ata. Having ascertained the altitude of the pass by means of the hypsometer, we began the descent, which for a couple of hundred feet was very steep, but afterwards became easier. A little beyond a spring of water the track left the valley and led up to another but easier pass, near which we suddenly came on a herd of burrhel. We were now approaching level ground, and, as we trudged on towards the end of our troubles, we thought with complacency of the eleven passes, averaging about 14,000 feet, which we had crossed in fourteen marches. We had still jungle before us, and this retarded the progress of the yaks along the narrow valley on the south side of the second pass, but at length, though darkness overtook us, we reached Issok Bulok Agzi without mishap.

CHAPTER XVI

My friends the Kirghiz—Rejoining the caravan—Return of Islam—Second Christmas at Zad—Down the Kulan Urgi valley—Tir revisited—Ice still too weak—Excursions from Tir—Cold bivouacs—Frozen rivers—The Kuramut Dawan—Apathy of natives—Guide frost-bitten—Ghosts—Down the Yarkand River—News from Kashgar—Alarm about plague—Annoying natives—Langar—Tashkurghan River—Narrow escape of caravan—Rotten ice—Bridging—Donkeys escape cold bath—Description of valley—Short of money—Bad part of track—Cutting ice-steps for animals—The Kesin Pass—Surveying under difficulties—Evicting animals from house—Unpleasant surroundings—No water—An unexpected meeting—Crossing the Teriart River—Waterproofing my garments—Curious cavities in rocks—Sending news to Kashgar—Task completed—Back to Chumdi—Up the Asgan Sal valley—Robbery by Chinese official—Completion of journey—Return to Yarkand.

AT Issok Bulok Agzi it was necessary to halt for a day that the men might repair their cherooks, which had become quite dilapidated. So lofty and precipitous were the walls of the narrow valley that the winter sun was visible only for about three hours a day, but there was abundance of firewood, and we cheered ourselves with blazing camp-fires. I now obtained a much more satisfactory chronometric value for the longitude of the place than I had formerly been able to obtain, and I was anxious to revisit Zad, to check the longitude I had assigned to that spot, and also that of Bazar Dara, which was connected with Zad by triangulation.

As on the morning of the second day Guffar had not arrived with the ponies, we loaded the yaks with our baggage, and started to rejoin the caravan. When within a few miles of Kiziljy (or Camp 25) I met the ex-Beg of the district, his tent being close to my route. He invited me to enter, apologising for not having given me a suitable reception, and expressing the hope that I was not annoyed at the absence of formality, which, he assured me, was due solely to his desire to avoid the appearance of asking for my intercession with the Chinese for his reinstatement in office. I made out that the reason of his dismissal had been the permission he had granted to the Kanjuts to occupy and cultivate the land at Azgar. This invitation was connected, though only remotely, with the Kanjut question, but to decline it would have been offensive, and entering his tent I seated myself on a numnah in front of a small fire which gave his abode a cosy look. He produced excellent chapatties fried in butter; but the tea, which had been stewing for a long time in a dirty-looking copper vessel, called a "chagan," was stronger than I could swallow. The weather happened to be uncommonly warm, the shade temperature at 2 p.m. being 28° F., and on this ground I begged to be excused the drinking of the hot tea. My host's wife and daughters, one of whom was quite pretty, were not at all discomposed by my presence, but continued their domestic duties while listening to the conversation. Then old friends from Zad came in and gave me interesting information concerning the country and the routes. I detailed my recent experiences, and had the consolation of listening to vehement denunciations of the Tajiks, who were roundly described as liars and the offspring of liars. One of the company informed me that he had travelled three times along the easy route which, from Mariong to Serai (or Camp 136), was only a three days' journey, practicable

for laden animals at all seasons of the year. This was the route by which I had wished to travel, but in summer the Yarkand River would probably be impassable for baggage animals. From Serai, they told me, there was an easy route over the Ushdir Pass, practicable for laden animals (except after a heavy fall of snow), separating, on the west side of the pass, into two tracks, one of which went to Ilisu and the other to Mazar Sultan. The valley in which Camps 135 and 136 were situated, known to Tajiks as Misgan, or Miskan, was called Misgar by the Kirghiz. Tahir Beg and the Kirghiz had tried to reach Raskam by the Fortash route, but had failed owing to the deep snow on the Kokoi Kochkar Pass. Across the high snow-clad range between Kulan Urgi and Raskam there was no route. The Kirghiz, I was surprised to find, preferred the Misgar route to that by Bazar Dara; they disliked the fords of the Yarkand River between Bazar Dara and Surukwat, and would never travel by that route in winter unless when accompanying me. I asked my host how the Chinese authorities regarded the visits of Europeans, and he assured me that they had sent strict orders that any British traveller who might visit their neighbourhood should be hospitably received and assisted. In my case the Kirghiz heartily carried out these instructions, not for any reason personal to myself, but on account of my nationality, and also on account of their pleasant memories of Younghusband. The ex-Beg frequently asked me for news of this distinguished traveller, who, he told me, was affectionately remembered and held in great respect among them.

On issuing from the tent I found the caravan waiting for me, and, having journeyed for a short distance, we camped at Kizil. In the evening Islam returned from his mission to Tashkurghan, bringing thirty sarrs (about eighty rupees) which he had borrowed for me. He re-

ported that the Chow-Kuan had become more suspicious of me, had sent to Wacha first a humble official to inquire whether I had given any trouble to the inhabitants, or taken supplies without paying for them, and, later, a Beg to ascertain what I had been doing in Wacha, and in what places I had erected pillars. I had, at the time of my visit, fortunately told Sher Mohammed and the Ming Bashi of Wacha that the pillars ceased to be of any use as soon as I departed from the locality, and that any one who cared for mountain exercise was at perfect liberty to level them with the ground.

On Christmas Day, 1898, I was once more at Zad and in occupation of the same tent (ak oey, literally white house) in which I had, in solitude, spent the Christmas of 1897. Dass, the cook, knew that Christmas was the Sahib's burra din (or holy day), which to his professional mind was synonymous with a day of feasting. He inquired what he should prepare for dinner, suggesting, among other things, a plum-pudding. I expressed no preference for this article of diet, but Dass was desirous of showing his skill, and plum-pudding was prepared. The main or only ingredients were the shakings of the biscuit-bag, ghee, sugar, and a few currants. The process of manufacture was simple: the ingredients were stirred together, heated over a fire, emptied into a pudding-dish, decorated with a few breadcrumbs, slightly baked, and then served. If the result was not perfectly satisfactory my respect for the cook was undiminished, and I found compensation in the beverage which had been carefully reserved for this day's feast.

It happened that the Beg of Zad had gone with Tahir Beg to attend to official duties at a distance, and I had the honour of receiving a visit from his wife, who came to state the reason of her husband's non-appearance. He would have attended to my wants personally had he not

been absent, but his wife, a kind and good woman, made amends by sending chapatties fried in butter, and lassi (a sort of curd), about all she had to offer. The people are poor, with little or no money to spend, and they live mostly on the proceeds of a few months' labour in summer. The principal articles of consumption are preparations of milk and Indian corn, and the fact that they thrive on such diet shows that they are possessed of wonderful digestive power. Tea, flour, and rice are delicacies too costly to be used except on rare occasions. The household articles which came under my observation in the tents of the poorer people were some coarse numnahs, some plain, others ornamented, pillows, a large cooking-pot, supported on an iron tripod, and a couple of "chagans." If the weather happened to be hot a few spare coats would be lying about. The tents were of simple construction, consisting of one main room, of which a small part was separated by a screen of reeds to serve as a store-room. There was no woman's quarter; the two sexes mixed freely together, morality as understood in Europe being non-existent. The ex-Beg's tent at Kizil, and the tent which I occupied at Zad were much neater than those in general use, and were ornamented with a border of reeds, arranged vertically to a height of about four feet from the ground. The tent I occupied at Zad contained two piles of ornamented numnahs, and it had an air of comfort which indicated comparative wealth on the part of the owner, probably not acquired by any enterprise of his own, but rather saved out of the squeezings he had effected during his period of office as Beg.

The Kulan Urgi valley below Issok Bulok Agzi contains few Kirghiz, and, according to all accounts, the valley down to that encampment is, during summer, forsaken by nearly all its inhabitants. When the warm

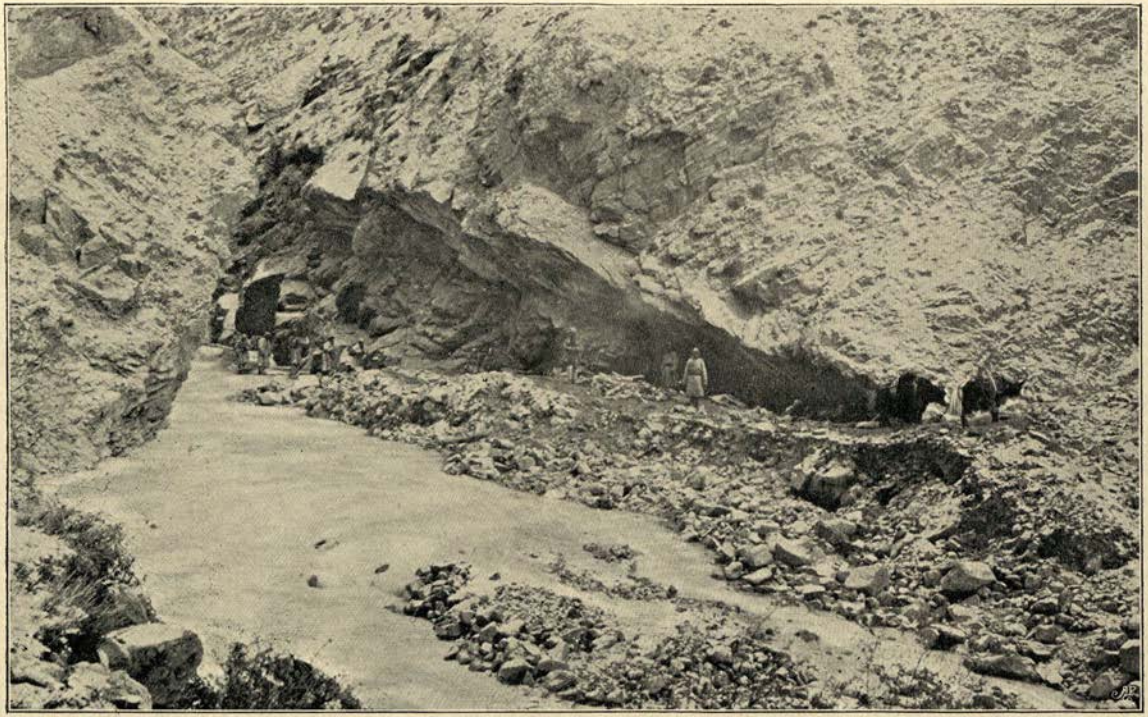
weather and the long days set in, the people migrate with all their herds to the pastures in the neighbourhood of the Yarkand-Leh trade route. There the yaks are hired by the Indian traders for the transport of goods along the difficult portions of the route; the Kirghiz are paid mostly in kind, and when the season for traffic ends they return to their valley with supplies for the winter.

One night at Zad was sufficient for taking the requisite observations, and on the following morning I set out for Tir, where I intended to have my headquarters for several days. Marching down the Kulan Urgi valley, I met the Beg of Zad, and with him the men who had preceded me over the Mamakul Pass to Raskam. They told me that the route had been known to only one of their party, and that they had found the utmost difficulty in taking their ponies up the glacier at the head of the Pil valley. Their yaks had become so tired and footsore that they had to be taken to a patch of grass in the Kulan Urgi valley and left to rest. The men would never willingly take that route again.

As I approached Tir, the Yuz Bashi of which had been beaten on account of the trouble he had caused me a year before, I could not help considering whether the reception awaiting me would be favourable or the reverse. When still several miles from the village I saw a large number of people coming towards me, and on meeting them I found that their purpose was to welcome me. Among them was the ex-Yuz Bashi, who showed no animosity, but, on the contrary, expressed his pleasure at my return, and promised to accompany me on my excursions to the Kuramut and Sandal Passes, where I meant to test the statements of the Asgan Sal villagers as to the merits of the respective routes.

From Issok Bulok Agzi I had sent a man to examine the ice on the Yarkand River and ascertain whether it was

strong enough to bear the weight of the caravan. At Tir I received his report that the ice below the mouth of the Kulan Urgi river was still too weak, and as there was thus no need to hasten from my present quarters I set about my purposed investigation of the neighbourhood. My first excursion was to Tarim Boko, at the foot of the long and steep ascent to the Kuramut Pass. It was fortunate that we took with us only very few yaks, for the place was desolate, grass scarce, and the track slippery and stony. Close beside a frozen stream we found some rocks slightly overhanging, and beneath their shelter we spent two comfortless nights. Ram Singh and I ascended to the top of the pass, which was at once bare, sharp, and rugged, suggesting the edge of a huge razor sunk between fragments of scattered rock. The place was swept by a strong wind, and at noon, with a bright sun shining, the temperature was at—5° F., or thirty-seven degrees below the freezing-point. Ram Singh's sketching was carried on with very great difficulty. To screen him and the plane-table from the wind a felt rug was held up by two Ladakis, but they, hardy though they were, suffered from the united effects of a high wind and a low temperature. On this day Islam had set out for Yarakand for money and provisions. He had crossed the Kuramut Pass and gone some distance beyond it under the guidance of a boy, whom I had ordered to spend the night at the first village in the Asgan Sal valley, and on no account to attempt to return the same day. Next morning when I awoke I was surprised and annoyed to hear the voice of this boy. He was wretchedly clothed, and yet, disregarding my instructions, he had recrossed the pass in the small hours of the morning, when the temperature must have been quite twenty degrees below zero. When I asked him if he was frost-bitten, he said no, he was all right; and when I questioned him about his reason for



BIVOUAC AT TARIM BOKO.

returning at night contrary to my orders, he astonished me by saying that between Tarim Boko and Tir there was a dreadful ghost (or spirit of some sort), and that he had hastened back that he might not have to travel over that part of the way alone. Against undue risks from want, exposure, and other dangers of the way I could, in general, make adequate provision, but dangers arising from ghosts were quite beyond my reckoning, though it was now evident that they ought not to be ignored.

When I went back to Tir several of the villagers, none of whom possessed more than the bare means of subsistence, complained to me that a Chinaman who had come amongst them two days before was living at their expense. This man had given out first that he was a clerk to the Chow-Kuan of Karghalik; then, that he was a soldier; and when he came to visit me he stated that he was a collector of petty taxes. He appeared to be no better than an impostor, and I advised the villagers to send one or two of their number to Karghalik to lay their complaint before the Chow-Kuan. But in Tir, as in other parts of the world, everybody's business was nobody's business, and the Celestial continued to live on the best, paying not a dachen for his supplies. The villagers, calling the man a robber, and thinking that Europeans possessed unbounded influence, begged me to do something for them, on the ground that they could do nothing for themselves. About two years before this they had had a dispute with the Kirghiz respecting some grazing ground on the Bazar Dara side of the Kukalung Pass. They had drawn up in their own language a petition to the Chow-Kuan, setting forth their claims; this document they placed in the hands of the official interpreter for translation and presentation to the magistrate; but the interpreter had been got at by the Kirghiz, and waited for a bribe from Tir as an inducement to perform his

official duties. The Tir villagers could not afford so large a bribe as the Kirghiz had given, so the interpreter waited and waited till the matter dropped out of sight, and the Kirghiz gained their point. Whatever might have been the merits of either case, I plainly could not interfere between the Tir villagers and the Chinese; and on my telling them so they expressed keen disappointment.

My next excursion was to the Sandal Pass, where Ram Singh sketched while I took observations at Keshna. When my work was done I sat in front of the camp-fire and chatted with the men, asking them questions and now and then making commonplace statements, which they were far too knowing to accept. It was interesting to notice that the more circumscribed the knowledge of the men, the more incredulous they were, showing an intellectual honesty which, in these days, was refreshing. Two of my Ladakis told me that they had never been further south than Kashmir, and they were as innocent of modern improvements as were the men of Tir, who had never been beyond their own valleys. They might possibly have heard of railway trains, but that these were driven by steam they could not believe. Bullocks or ponies hidden by the carriages might, they thought, somehow drag them along, but beyond this perfectly rational position these children of Nature would not go. While they rejected my statements, their looks said more plainly than words, "Do you suppose that we are fools?"

In a third excursion we bivouacked in the main valley, which presented no features of sufficient interest to be here described. Ram Singh and I had now seen and surveyed the region; we had ascended the Yarkand River from Tir to a point almost in sight of Sanglash, and from Bazar Dara downwards, except for a few miles, we were familiar with that portion of the river. It was therefore

with pleasure that we heard that the ice was now sufficiently strong to bear the weight of the caravan, and we made preparation to resume our journey. On the day before we set out the boy who had guided Islam across the Karamut Pass came to me and asked me to cure his feet, which he now, for the first time, told me were frost-bitten. At the moment I could do nothing for him, but I offered to take him with me and attend to his toes as soon as possible, assuring him that if any operation were necessary it would be painless, and offering to feed and clothe him till the cure should be complete. The boy was disappointed; the very suggestion of the amputation of lifeless toes terrified him, and he ran away. Another unsatisfactory affair required to be dealt with. I had come to the conclusion that the ex-Yuz Bashi of Tir had received hard usage in purse and person for misdirecting me the year before. My proceedings against him had originated in the statements, mostly lies, of the people of Asgan Sal, and, though his instructions might have been more explicit, I was convinced from my examination of the ground that he had not wilfully done me wrong. I frankly told him so, and in acknowledgment of my mistake gave him a present of 10 sarrs (27 rupees), which so pleased him that he expressed his willingness to be beaten again on similar terms.

On leaving Tir we crossed the Yarkand River and, re-entering Sarikol, made our way to the small village of Burangsal inhabited by Tajiks. The place had a snug appearance, without the poverty-stricken look common to most villages in this region, and I was quartered in a cosy, well-built house, the owner of which presented me with some partially dried grapes of local production. This valley was small but fertile, evidently yielding crops in excess of local requirements, for Mohammed Joo received many offers of supplies of barley.

For the distance from Burangsal to Jurab one short march was sufficient. The valley was rocky and sandy, destitute of grass, and in its winding course was such as could only be traversed in winter when the river is frozen over in many places. I had a Tajik guide and, on Tajik authority, hoped to find at Jurab two shepherds' houses and a large "ungur." On reaching the mouth of the valley, the spot indicated, I requested the guide to point out the "ungur" and he waved his hand towards the foot of a vertical cliff, where I perceived a patch of sand partially protected by a sandbank from the wind which was blowing down the valley. The two houses were not here, but at some distance up the valley. For myself and the caravan this day's march was short, but Ram Singh, an indefatigable assistant, had taken a long and difficult round of exploration. Having ascended the Burangsal valley for a short distance, he had crossed the Tarsi Pass, about 6,000 feet higher than Burangsal, and it was not till late at night that he rejoined me at Jurab. Here the bivouac was on sand; the couch was soft, and I slept comfortably till within a couple of hours of daybreak, when a squall sprang up, bringing clouds of sand, leaves, and twigs, which banished sleep and comfort. The trouble moderated when daylight came, and at breakfast the quantity of sand which mingled with my food was less than I had expected.

Ram Singh set out in the morning to execute sketching work, while I went with the caravan on a short march to the mouth of the Kichik Tung valley. When I had nearly reached this destination I was surprised to see a man in a soldier's blouse rapidly approaching. He was a messenger from Kashgar under orders to find me as quickly as possible and deliver a letter and parcel. Macartney had regarded my reference to Sonam's illness as an intimation of a case of plague in my camp, and had

accordingly made due notification both to Chinese and Russian officials. M. Petrovsky kindly offered to send the Russian medical officer on "plague duty" at Kashgar to examine and treat my man; but, fortunately, Sonam's fever and buboes had quite disappeared, and the patient was now in good health. The incident showed the care exercised by Russia in guarding against the approach of the dreaded plague, for, when the Russian doctor was sent to Kashgar there was no known case of plague nearer than Bombay, fully 1,500 miles distant.

Soon after I reached Kichik Tung, some men from Tung arrived and I tried to extract from them information concerning routes. Their replies were indefinite, and when supplemented by further replies, became more indefinite. The men (Tajiks) could not answer a plain question twice in the same way, and finding their examination too irritating, I turned them over to Mohammed Joo.

Here the Yarkand River valley seemed absolutely barren. The only living creatures I could find were small lizards, which must be possessed of great power of endurance to bear the intense cold of winter and the fierce heat of summer. Of birds I saw not one; no chicore, nor even the common sparrow which can pick up a living almost anywhere, could find sustenance in winter in this barren land. Close to the mouth of the Kichik Tung valley the track was so steep and rocky that all the animals had to be unloaded and the baggage carried up by men. The ice in many places was remarkably transparent, and its surface was often marked by ripples like those on the sand when the tide has ebbed. Some of the smaller rivers looked as if they had been suddenly arrested by the frost; the water seemed, at some places, still to shoot in small cascades; in other places to boil and surge, and where the bed was smoother the form of the long

waves remained; but all was at rest and almost noiseless.

On January 10th I reached Langar for the fourth time, and found waiting for me letters which had been brought from Tashkurghan by my messenger from Tir. The villagers of Langar could provide me with no supplies but a little barley and one or two old roosters. They were, I found, themselves dependent on Takla for provisions. Hitherto Ram Singh had been able to reach points of sufficient altitude to be able to see positions already determined, and to fix others; but lower down the valley it was impossible, in the time at our disposal, to climb mountains of bare rock on either side. We therefore resorted to pacing in our measurements, and to this method we adhered until we reached Kosarab.

When we came to the Danga Bash, or, as it is called in the latter part of its course, the Tashkurghan River, we found, as we had been told near Jurab, that it was not frozen over, and was far too deep to ford. We therefore left the valley of the Yarkand and advanced up that of the Tashkurghan River, the volume of which seemed equal to quite one-third of that of the Yarkand above the confluence. This side valley, in its lower part, was as barren as the main valley, and on the right bank where we were marching we found a troublesome rocky slope. But the river was fringed on both sides with ice several yards broad which looked strong, and I was tempted to allow the caravan to proceed upon it. The ice, however, soon began to crack and to be overflowed with water, so that the animals had to walk at considerable intervals, and the drivers had to exercise great caution. I climbed the bank to view the valley ahead, and saw a close succession of ice-floes, some very large, coming down the open water at a rapid rate. I shouted to the men to bring the animals off the ice wherever they could find

access to the bank, and the next few minutes were the most anxious and exciting I had spent for a very long time. The ice on the right bank was covered with water, and under the weight of the ponies it swayed up and down most alarmingly. My first impulse was to rush to the assistance of the men and animals, and the salvage of the baggage, for bedding, instruments, journals, and other valuables were in jeopardy; but I perceived that I should increase the weight on the ice with no chance of any compensating advantage. The danger was of short duration, and just as the last of the cavalcade reached the bank a large ice-floe became jammed between the ice-fringes, checking the current, which after an instant broke through with great force. The ice-floe came crashing onwards and tore up the ice-fringe where, a few moments before, the men and animals had been plodding wearily along. While thanking a merciful Providence for this escape, I was delighted to perceive a company of villagers from Oey Bekay hastening to our assistance. They helped our men to take the ponies up the steep bank from the brink of the river, and then to carry the baggage over that portion of the track where ponies could not carry it. Soon after dark we reached the small village, where a small house, very dirty and out of order, was assigned to me. This dwelling was in one block, divided into three rooms by two partitions, through each of which there was a low doorway. The roof was flat and very low; the rooms were ill-ventilated, the chimney, or hole in the roof, being too small to allow the free escape of the smoke. I occupied the inner room and Dass took possession of the central one, but a miscellaneous population of fowls, sheep, and goats, rats and mice with their hereditary enemy the cat, was distributed through the house.

Near this village it was necessary to cross to the

opposite side of the river. We were told that a very little higher up the stream was fordable in spring and autumn; but now the ford was so fringed and beset with ice and the river so dammed up with ice-floes that to attempt to effect a passage seemed quite dangerous. Still, we resolved to try, and procuring baulks of timber and doors from the village houses, we constructed a very rough and simple bridge from ice-fringe to ice-fringe. On both banks the fringe was so soft that men and donkeys sank through it, but neither suffered serious harm, and the whole caravan was transferred in safety to the left bank. A short distance further up we had to recross, but at that place, fortunately, the ice was sound, and we had no trouble. Proceeding up the right bank, we had a view of the village of Kozey which, surrounded with apricot and other trees, provided an agreeable variation in the monotonous landscape. Beyond this village there was no room to ascend on the right bank, but there was an ice-fringe jutting out a few feet from the cliff, and on this the unladen donkeys were able to walk and thus avoid the crossing. The rest of the caravan had to cross by a ford, rather deep and very stony, but quite free from loose ice, a couple of camels having been provided to carry over the baggage. Twice again the ponies had to cross the stream before we reached Beldir, a village which at first seemed utterly deserted. On our approach every house appeared shut up, and not an inhabitant was to be seen, but by and by some Kozey villagers arrived, and then the Beldir people began to show themselves. They had never seen a European, for before me none had ever penetrated into that dreary valley, and the inhabitants had probably been terrified by strange reports.

On both sides of this valley were numerous small villages, which for months in summer must be almost

completely isolated owing to floods in the river. Between some of them there were routes over steep, rocky ground, but these were said to be so bad as to be impracticable for ponies. In winter the deep snow lying long on the ground often completely blocks the routes, and the bare mountain-walls on either side exclude the sunshine except for a few hours a day.

I now perceived that I should have to abandon my long-cherished purpose of revisiting Wacha to get a check on the longitude. The river was almost everywhere open in mid-stream; to find a practicable route it would be necessary to cross and re-cross very frequently, but the fords were impracticable or dangerous. Doubtless men could have been found in sufficient numbers to carry the baggage, but the condition of my treasury did not warrant the adoption of this method of transport. The utmost limit I could hope to reach was Kosarab.

At Shoti, 10,000 feet in altitude, we found shelter for a night in two deserted stone huts, so low that I could not stand upright without knocking my head against the roof, and bringing down showers of dust and soot. During the night and most of the following day, snow fell. Against the vertical mountain side, close to Shoti, there was a rough scaffolding, overspread with brushwood and large stones, so that it formed a sort of viaduct along which the donkeys were able to pass with their burdens, though, to escape projecting rocks, the ponies had to be unloaded. For a long distance above this spot the bottom of the valley was only a few yards wide, and for several hundred yards it was covered with slippery and sloping ice, so that it was necessary to hew out a series of steps and sprinkle them with earth before the caravan could proceed. The latter part of the ascent to the Kesin Pass was quite good, and, as far as we could see through the mist and the fine falling snow, there was abundance of

grass. At the top (12,900 feet) the temperature was at 0° F., but Ram Singh, protected from the snowfall by a large numnah held over him and the plane-table by two men, pursued his labours indefatigably. Before it was quite dark we reached a small group of houses, mostly uninhabited. The occupants of the largest of the dwellings gave me the use of their abode for the night, going themselves to some neighbours down the valley, but leaving their live stock under my care. The poultry would not be evicted, but raised so much dust that the effort to dislodge them had to be discontinued. The domestic donkey, sheep, and goats were easily turned out, but re-entered whenever the door was open. As the door could be barred only on the inside, I resigned myself to the company of these animals, which passed the night on fairly amicable terms with my new dog, "Yul Bash." Ram Singh, Abdul Karim, and Dass were sheltered under a dilapidated outhouse, while the caravan men slept with only the baggage round them. We obtained here a little chopped straw and barley, but no water, only some muddy ice for our own use.

Early next morning I started off to pace the distances, and Ram Singh devoted himself to sketching the narrow valley which enters the Chorlang valley at Bagh. In the Chorlang valley, which was so narrow and winding that surveying operations were tedious, there were several villages with trees about them.

When about six miles from Kosarab I was surprised to see a smartly dressed native of India, wearing a bright scarlet lungi, approaching me in company with Islam. He proved to be Mohammed Ramzan, native doctor to the 16th Bengal Cavalry, but now attached to the British agency at Kashgar. He had been sent by Macartney to attend to Sonam, who, however, was now in perfect health. His excellent clothes of the newest Kashgar cut,

long boots, and high-heeled leather slippers, presented a great contrast to my patched old puttoo suit and putties, fur cap, and rubber-soled canvas boots. We walked on together and found it necessary several times to cross and recross the Teriart River a little below the point where it is joined by the Tekesekerek. My pony was at some distance, and, as the stream was shallow, we easily waded across, the water which was splashed over my putties freezing into an admirable waterproofing. At some of the fords there were stepping-stones, treacherous with a transparent film of ice. These I avoided, but Mohammed Ramzan, with less experience, trying once to use them, slipped and fell into water deep enough to soak his fine garments. The incident was less amusing to him than it was to me, but no serious harm resulted, and, on reaching the village of Kosarab, he put on dry clothing, while I, standing in front of a big fire, removed the waterproofing from my putties.

The extent of the village of Kosarab surprised me in view of the poverty of its surroundings. The whole neighbourhood being very bare, with few signs of cultivation, such prosperity as the locality enjoys is probably due to the gold washings carried on in summer on the banks of the river. In the neighbouring mountains coal, copper, and iron are found, but the natives have little energy or enterprise, and the minerals remain unworked. As to the amount of gold annually obtained on this stretch of the river, I had no time to make inquiry; but undoubtedly gold is found in some small quantity, and is dealt in at the village at the rate of 26¼ of silver to 1 of gold. A more important question is that which relates to the region whence the gold is borne down by the stream. This problem awaits solution by other travellers.

From Kosarab, Mohammed Ramzan set out for Yarkand, and I sent Islam direct to Kashgar to inform

Macartney of my whereabouts, and to set his mind at rest as to the suspected case of plague. At Kosarab, as at smaller villages, there was trouble in making payment for supplies received; not that disputes arose between me and the vendors, but these were so numerous, and the separate contributions were so small, that it would have required a large amount of copper coin to pay them individually. My usual method of procedure was to instruct the caravan bashi to give public notice that I would pay for whatever provisions were supplied, and to tell the Ming Bashi or Yuz Bashi to have the accounts ready. Having compared the quantities received with those stated by the villagers to have been supplied, I paid the Ming (or Yuz) Bashi in the presence of as many of the inhabitants as could crowd round us, and then asked him two or three times whether I had paid him in full for everything. Doubtless squabbles arose as to the amount due to each, and these squabbles were complicated by the sharp practice of the official, who (as at Kosarab) would try to satisfy the villagers with payment at ordinary rates, he having been paid at the high rates expected of British sahibs. This liquidation of accounts, however, was not my business, and only in very exceptional circumstances would I interfere.

The most difficult part of my task was now almost accomplished, only the short stretch of the Yarkand River between Kosarab and the mouth of the Tashkurghan remaining to be surveyed. With a few men and animals we ascended the main valley as far as Sawas, the furthest bivouacking ground to which ponies could be taken. Next morning Ram Singh and I paced up the valley to a point within sight of the country surveyed from the south side of the Tashkurghan River, and we passed a remarkably sharp loop of the Zarafshan River, as the Yarkand is there called. In several places here, as well as further

to the east, we noticed circular cavities in the rocks, some close to the river, others (mostly near Sawas) high above it. These had been neatly drilled by natural forces to a depth of 8 to 10 feet in some cases, while in others the depth was about 5 feet, the diameter at the top being from 2 feet to 2½ feet.

Resuming our caravan journey to the east, we revisited Ay Tash (Camp 46), whose name was now stated to be Ara Tash. From Chumdi we ascended and surveyed the Asgan Sal valley to a spot whence we could see the country which we had surveyed from the Sandal and the Kuramut Passes.

At Oyung excellent pears are grown, and, as I approached the village, I hoped to purchase a large supply, but I had been forestalled by a Chinaman, who, in the absence of the grower, had obtained the fruit from his timid wife at about one-tenth of its value.

Following the right bank to the Yarkand, I worked down to the point where the river is crossed by the road to Khotan, thus completing the survey of the stretch from Bazar Dara, a length of about three hundred miles, of which at least that portion between the west end of Raskam and Kosarab had never before been surveyed. The completion of this work was highly satisfactory to myself, and in considering the circumstances in which it was carried out, I am inclined to attribute its success not merely to the local assistance I obtained, but also, and in large measure, to the opposition I encountered. The physical difficulties to be overcome with the limited means at my disposal were very formidable, but these seemed to dwindle and lose their importance when artificial difficulties were interposed, and when I was delayed, obstructed, and thwarted by persons who had not the candour or the courage to declare themselves. The depression which I experienced after three unsuc-

cessful attempts was counteracted by the knowledge that my failure would mean the success of the opposition, and I resolved at all hazards to complete my task. The practical result of the obstruction was that the survey embraced a much wider area, and was carried out in a far more satisfactory manner than I had ever anticipated. In this view of the matter I have to acknowledge my obligations to those who unintentionally constrained me to extend the range of my observations, and to take up positions whence I could check and review my work.

On February 2nd, after a three months' tramp of more than one thousand miles, I was once more at Yarkand, and in occupation of my old quarters.

CHAPTER XVII

Trouble about money—The Khan Arik route—Large oasis—Khan Arik—Meeting Macartney—Hospitable hosts—Civilisation—Muz Tagh Ata and Mount Kungur—The Taotai—Formal complaints—His promise—Dinner with the Taotai—Feeling a fool—M. Petrovsky—Swedish missionaries—Macartney's position—Departure from Kashgar.

AT Yarkand I learned that the Chow-Kuan had recently sent to the Beg of Sarikol to inform him that I had gone to the mountains and was travelling without a passport, and that he had commanded the Beg to ascertain what I was doing. This order, which ended with the usual formula, "tremble and obey," had probably been sent by direction of the Taotai, for I had told the Chow-Kuan, before setting out, that it was my intention to travel in Sarikol, and, as far as possible, I kept him acquainted with my movements. Instead of objecting, the Chow-Kuan had sent a subordinate official with me to facilitate matters.

Remembering the sharp practice of the Indian traders in the matter of the bill of exchange in October, I made careful inquiry before offering another bill for sale. The chief traders at Yarkand formed a sort of "corner," at the head of which was Pundit Boota Ram, and they had conspired together to over-reach me a second time. Raju, who had been left behind during the winter to buy ponies, knew of their intention, and the rogue acted in

their interest. He had borrowed money in copper from Boota Ram, but, entirely without warrant, he had entered into an informal understanding with him that the money would be repaid by a bill on Bombay at the rate of 6 tongas 20 dachen per rupee. When I now inquired of various traders at what rate they would buy a bill, they offered 6 tongas 20 dachen, though it was clear that, but for Boota Ram, they would have offered higher rates. I applied to Dr. Josef Messrur, the Persian missionary, for assistance, and he, very quietly, but with much trouble, sold a bill for me at the rate of 7 tongas 5 dachen per rupee for copper, or 2½ dachen less for silver, so that I was able to repay Boota Ram the borrowed copper money, and to deprive him and Raju of their prospective gains. When, in making the repayment, I tendered interest to that mild Hindu, he assumed his most innocent and injured look, and said reproachfully that he could not dream of making money out of me. Raju looked deeply disgusted, but his share in the matter I passed over in silence, for, on the principle that "the devil you know is better than the devil you don't know," I resolved not to part with him. In his purchases of ponies and donkeys for me, he had, indirectly, made some gains for himself, but this was to be expected, and, at all events, I had now suitable animals, fresh and in good condition, so that I was ready to set out for Kashgar. Despatching Raju to the Kugiar district to buy four camels by way of experiment in my next journey into Tibet, and leaving Abdul Karim to look after the tired animals, I set out for Kashgar on February 10th by the Khan Arik route, intending to get good values for the longitudes of the various halting-places. I subsequently learned that Dr. Sven Hedin had travelled by a part of this route, but I had then neither his book nor his map to enlighten me.

The oasis of Yarkand is a comparatively fertile region, where food stuffs are abundant and cheap, while at Kashgar the local production is insufficient for the local requirements. There is, therefore, a brisk trade between the two towns, flour, rice, and other agricultural produce being sent to Kashgar in considerable quantities. This trade the Chow-Kuan of Yarkand regards as injurious to the interests of his district; he has declared it illegal, and

THE WALL OF YANGI SHAHR, YARKAND.

has stationed officials at Oey Bagh Langar, the limit of Yarkand cultivation, to suppress it. These officials, however, in accordance with Chinese methods, are underpaid, and, for their livelihood, are dependent on "squeezes" and bribes, so that the short-sighted policy of the Chow-Kuan is defeated, and trade takes its natural course.

At Oey Bagh Langar we entered the Takla Makan Desert and traversed a region waterless except at Langar,

where was a spring and two ruinous houses. Here the weather was unusually cold, the thermometer indicating a temperature within one degree of zero F. at seven o'clock in the morning. When we approached the oasis of Tarim, the country laid aside its desert aspect. At the eastern edge of the cultivated ground the Yuz Bashi did me the honour of meeting me, and he led me to a roomy house a little beyond the bazaar. The extent of this oasis surprised me, but the scarcity of water was a cause of bitter complaint on the part of the Yuz Bashi. Similar complaints were made at Yupugay, where there is an oasis about four times the size of that at Tarim. When I passed through its bazaar, it was crowded with people in holiday garb, who were celebrating the *id* or end of the *roza*, the Mohammedan fast. Both Tarim and Yupugay are in the Maralbashi district, but are dependent on the Beg of Tazgun for their water supply. From Tazgun a large irrigation canal passes through both of these oases, and, by way of backsheesh or blackmail, but in consideration of keeping the canal supplied, the Beg of Tazgun had for many years received 1,000 tongas annually. For the last two years, however, the inhabitants of the oases had stopped this payment, and the Beg had cut off their water supply. In the hope of securing at least some stunted crops in early summer, the people had had their fields flooded in winter, but the results were unsatisfactory and complaints were made to the Taotai. This dignitary ordered the matter to be investigated by a humble official who duly went to Tazgun, received his bribe from the Beg, saw the water actually running for half a day, and returning to Kashgar, assured the Taotai that the supply was abundant.

On entering Khan Arik (Royal Canal) I found no sign of welcome nor any preparation for any entertainment. I took up my quarters for the night in a very dirty serai or

inn, where, however, the innkeeper and his wife were polite, and provided me with the best they had at their command. In the evening the Beg's son came and offered me presents of dried lucerne, chopped straw, corn, and a sheep, making numerous excuses for the non-appearance of his father, but, as I did not believe the explanations, I did not accept the presents. Later, the large crowd which had gathered round the door of the serai began to disperse, and I ventured forth to the open space towards the bazaar to take observations. Then the multitude returned, but it was clear they had no hostile intentions, and I went on with my work. While I gazed at the stars I was gazed at by this quiet, orderly assembly who neither knew, nor cared to know, what I was doing, but were pleased with the unusual sight of a Sahib at work.

From information received at Tarim, Yupugay, and Khan Arik, I believe that the whole region extending from Tarim to the neighbourhood of the Kashgar River and included within the Takla Makan Desert, contains nothing but barren waste.

Setting out from Khan Arik in the morning, I walked for a few miles and was met by the Beg of Khan Arik, a fine-looking old man, the very picture of contentment and happiness. When we came in sight of each other, he dismounted and donned his official hat, which, wrapped in a handkerchief, a servant had worn outside his own hat. After the usual greetings had been exchanged, he and I remounted, he, a portly man, being assisted by two of his retainers. We rode on towards the Beg's house near Yigdarik, the last few miles being over uninteresting waste land covered in some places with a whitish incrustation. The house stood about a mile to the east of the road from Yarkand to Kashgar, and was the finest private building I had seen in Sin-Chiang. The courtyards were spacious

and well-kept, while the large one-storied house was singularly well-built and clean. When the Beg had, with the help of two attendants, reached the ground in safety, he took off his shoes or strong slippers and ushered me into a long, rectangular room with white-washed walls and numerous alcoves. The roof was very high, consisting of large rafters with uniform cross-pieces of wood between, while the floor had a thick covering of reeds and

NATIVE WOMEN GOING TO MARKET.

straw overlaid with Khotan carpets of bright colours and elegant designs. At one side of the apartment was a capacious fireplace with a bright wood fire, over which was a chimney which, unlike most others, did allow the smoke to escape. The repast consisted of tea, bread, coloured eggs, currants and sweets. Stretching myself on the floor, which was as soft as a cushion, I partook of these refreshments while waiting for the arrival of the

caravan. The Beg was evidently a man who had grown old in the enjoyment of comfort, probably, or rather certainly, the fruit of his "squeezings" during his tenure of office. He informed me that he had received strict orders from the Chow-Kuan of Yangi Shahr to escort me through his district and afford me every assistance; and, for this reason, he could not be persuaded to leave me till, at the boundary of his jurisdiction, he had handed me over to the Beg of Tazgun. He of Tazgun, more amenable to my wishes, left me before I reached Yangi Shahr; and, skirting that town so as to avoid oppressive attention, I marched towards Kashgar. As I hurried on I suddenly met Macartney, who, with his Chaprassie, Jaffar Ali, was looking out for me. It was only ten months since I had left them at Yarkand, but they had been months of toil; both my appearance and my garb had changed, and I was not recognised. However, my voice declared my identity, and my friend took me to his home, which seemed like a little oasis of civilisation amidst wastes of Asiatic barbarism. For me the place had something of an air of enchantment; the looks, the language, the conversation, the ways of thinking of my host and hostess were delightful, while the physical comfort derived from well-furnished rooms, table linen, plates to eat from, and glasses to drink from, to say nothing of the well-cooked viands, was such as I had never experienced before. None can appreciate the ordinary comforts of life like those who have been long deprived of them. Several days elapsed before the sensations of preternatural enjoyment began to tone down, and I was able to consider calmly the conditions of life in Kashgar.

One question which interested me and which I set myself to answer was, whether Muz Tagh Ata is visible from Kashgar. Having measured a base with one end

on the hill close to, and just in front of, the British Agency, I fixed the co-ordinates of the principal peaks in the high, snow-clad range south and west of Kashgar. On Curzon's map of the Pamirs there is represented a peak bearing the name of Mount Kungur. This peak I took to be the highest in the south-western range, but, being unable in Kashgar to ascertain its local name, I numbered it K2 (Kungur second peak). The height which I found for it was not 25,350 feet, but only 23,530 feet, the correctness of this altitude being, however, dependent on that of the barometric height assigned to Kashgar. K2, moreover, I found to be nearer Kashgar than Mount Kungur is represented on Curzon's map to be. The position of Muz Tagh Ata on this map is also incorrect, as it is really about twelve miles to the south-west and almost in line with Kashgar and K2, so that it cannot possibly be seen from Kashgar or any point near that town. This conclusion is confirmed by the fact that the latitude of the highest peak visible from Kashgar, as determined in favourable weather when the whole range was clearly seen, is 22′ 44″ further north than that of Muz Tagh Ata, which is 38° 16′ 43″.

Kashgar does not suffer by a comparison with towns which I visited further to the east. Its bazaar I found to be cleaner, its streets broader, its shops in general better stocked, and its inhabitants more prosperous-looking than in other towns of Sin-Chiang. Even on days when there was no market, the streets were alive with a busy population, and long droves of camels testified to a brisk trade carried on mainly with Russian Turkestan. The formidable mud wall round the town had recently been to a large extent re-built, and, with the moat beyond, gave an appearance of dignity and strength. Within the town there was no proper water supply, but men and donkeys were continually employed in

bringing the muddy fluid from the Kizil Su or Kashgar River. During my visit fever was prevalent.

In the course of my journeying it had been my habit, on arriving at any large town, to visit without delay the principal Chinese official; but at Kashgar I considered it advisable to be in no hurry in paying my respects to the Taotai, whose attitude towards me had been unfavourable. After having been a week in the

THE MARKET-PLACE, KASHGAR.

town I went to the Yamen, and it was easy to see that though the Taotai held a highly important office, he was weak, grovelling before the Russian Consul-General, and desirous chiefly of avoiding trouble. I complained of treatment I had received within his district, and he assured me that, whatever other officials might do, he would assist me to the utmost. I told him my plans, and he appeared to think it suspicious that I wished to revisit

Aksai Chin and the adjacent country. At length he laid aside his displeasure and said he had no objection to my plans, showing Macartney a telegram from the Tsungli Yamen respecting me. This message, enjoining the Taotai and other officials to afford me due protection while in Sin-Chiang, had come in consequence of representations made at Peking by Sir Claude Macdonald, but had probably been accompanied by secret instructions of a hostile character.

On a later day I was invited to dine at the Yamen and found neither the company nor the dishes to my liking. The Chinese, both the host and the guests, whether because they were sullen, or because the numerous dishes set before them demanded their whole energy, had nothing to say, and I found it impossible to draw any one into conversation on any subject. When a public post was mentioned, the Taotai said curtly that there was no public post, and there was no need of a telegraph line to Yarkand or Khotan, since these places had no Taotai. When I turned to Loo, the head of the telegraph office, who could speak English fluently, my advances were met with very brief replies. Nothing appeared to have any interest except the dishes. Every one, save myself, seemed to appreciate the ducks, ham, sea-weed, gizzards, eggs, lotus leaves and seed, sharks' fins, bamboo roots, soup, pastry, rissoles, Chinese potatoes, stewed pears, &c. The *pièce de resistance* was roast pig, which was regarded as a great delicacy and served with special ceremony. When the time for this dish came, the guests withdrew a little from the table, the top of which was then removed and another put in its place. On this the roast pig was served; then the former table-top was restored, and the dinner proceeded to its natural termination. When that consummation was achieved, the Taotai, a short man, escorted me to the door, holding my hand in his, swinging

STREET SCENE IN KASHGAR.

it to and fro, and inconsiderately clawing it with his overgrown nails. I knew that all this formality was intended to do me honour; but, to myself, my position seemed ridiculous.

The man whom, above all, the Taotai disliked and feared was M. Petrovsky, the Russian Consul-General, an official who, with very strong prejudices and a narrow intellectual range, made the Chinese cringe and bow before him. His behaviour towards the people among whom he lived was marked with disdain, but he expected to be treated with the most punctilious politeness. A few days before my arrival he had invited the ex-Chow-Kuan and his successor to dinner at a certain hour. The inhabitants of Kashgar, whether European or Asiatic, were not usually very precise in their reckoning of time, which, for local purposes, was ascertained by means of sun-dials; but it suited M. Petrovsky to be exact for once, and when, a few minutes after the hour, the two Chinese guests appeared at his door, he refused to see them. While he required subservience on the part of the Chinese, it was plain that he regarded as intruders men of other nationalities, whether settled in Kashgar or only visitors, and, if they were British, he called them spies and secret agents. To the Roman Catholic missionary, Father Hendriks, he was actively hostile, while to the two Swedish missionaries he showed marked unfriendliness. The missionaries' position was not an enviable one, and their prospect of success was small, but their work was rendered more difficult by the disfavour with which they were regarded by the Russian Consul-General. Any hint of the approach of a foreigner at once excited this man. From Prejevalsk he received a telegram announcing the arrival of Mr. Isidor Morse, whom Cobbold and I had met near the Kilik Pass, and the interest and anxiety which he displayed concerning this traveller, his nation-

ality, the purpose of his visit, &c., was simply laughable. It was easy for him to poison the minds of the ignorant Chinese officials, and set them against unoffending British travellers, and his efforts to this end showed the narrow-minded Russian official. The belief which he propagated was that the Indian Government wished to extend the Indian frontier beyond the Hindu Kush, and he insinuated that for this purpose I was working as their secret agent, as if any sane man would advise an attempt to seize remote, barren mountains and sandy deserts. M. Petrovsky, like some others, had somehow adopted the belief that Muz Tagh Ata could be seen from Kashgar, and when I told him the result of my observations and calculations he keenly resented my statement. He had, without any inquiry, made up his mind that the mountain stood within his range of vision, and he was not to be shaken in his belief by a British intruder with a theodolite.

Compared with the position of the Russian Consul-General, that of the representative of Great Britain appeared very unsatisfactory. The office filled by Macartney is that of "Special Assistant for Chinese Affairs to the Resident in Kashmir," and the Chinese, when they find it convenient to make little of his position, do not hesitate to remind him that he has not even the rank or authority of a consul. He has no escort, and, up to 1898, he had no uniform, whereas the Russian Consul-General was and is able to drive up to the Yamen wearing uniform and decorations becoming his rank, and attended by an escort of Cossacks. In the East, and especially in Sin-Chiang, the assertion of authority by the display of its outward signs is of great importance, and an official in mere civilian garb going unescorted to pay his official visits, seems to on-lookers half-disowned by his own government. Besides, an escort is required for the

security of the British Agency, not indeed in ordinary circumstances, but in times of popular excitement, when disorder and riot arise and spread with the rapidity of a dust-storm. The natives are in general peaceful and respectful, and the Chinese soldiers are, as a rule, obedient to their officers, but, in time of commotion, the show of respect is dropped, and the Chinese officers are ready to instigate assault. Even the Secretary of the Russian Consulate was at such a time attacked by the Chinese soldiery, in obedience to command. The strong position which Macartney actually holds in Kashgar is due to his own merits, his diplomatic ability, his linguistic attainments, his promptitude in action, and especially his intimate knowledge of the character of each of the races with which he is concerned.

In making preparation for my departure from Kashgar, I laid in a small stock of cloths of various colours and designs which should serve for presents in my future travels. Some tangible form has to be given to acknowledgements of attention received from natives, and, when the offer of money would be regarded as offensive, a few yards of cloth presented with some little ceremony and a few polite words, are highly esteemed. I found that one of Father Hendrik's converts, a Chinaman, was skilful in the preparation of a light beverage which proved an agreeable change from the impure water and the weak tea with which, during my peregrinations, I had in general been obliged to content myself. Having in view an extended journey in Tibet during the summer, I deferred most of my purchases till I should reach Yarkand, but, with Macartney's aid, I was able to lay in a sufficient supply of money. This I obtained partly from some Chinese who wished remittances sent to China, and partly from a Hindu money-lender who paid me at the rate of about 7 tongas 16 dachen for

a draft on Bombay, a rate more than one-eighth higher than that which I had accepted in Yarkand. For the sake of variety in the mode of travelling, and to enable all my men to ride to Yarkand, I purchased a marpa, or one-horse cart, for myself and some baggage, and on March 9th reluctantly said goodbye to my kind host and hostess and set out once more towards the East.

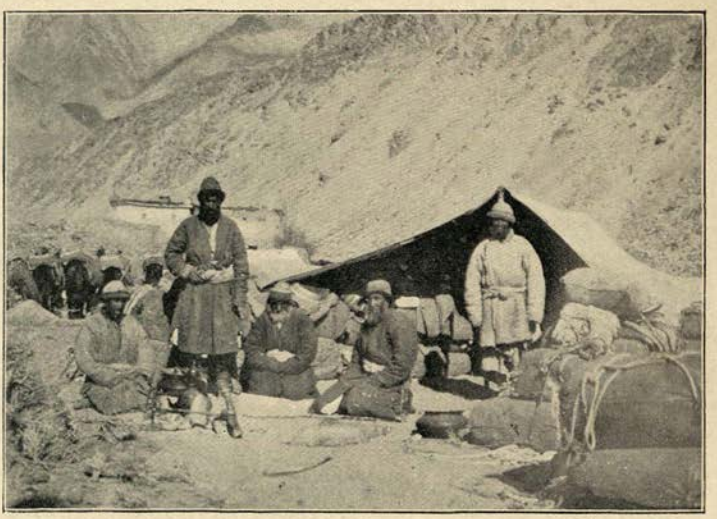
CHAPTER XVIII

Marpa—Preparations in Yarkand—Attack on missionaries—Plucky behaviour of Macartney—Delays in starting—Eastwards once more—Stopped at Khotan—Complaint to Macartney—Stormy interviews with Amban—Passport useless—Circumventing the Amban—Reply to complaint—Dust storm in desert—Arrival at Polu—Loss of sheep—Opposition by Chinese—Negotiations broken off—"Protection" refused—Raju dismissed—No assistance obtainable—Compelled to start.

THE journey to Yarkand, performed mostly in the jolting marpa, or native cart, took me over the monotonous, sandy and dusty main route by Yangi Hissar. It had been my intention to break the journey at Kizil and visit the tombs of Urdu Padshah and Hazarat Begum, both of which are annually visited by crowds of pilgrims. The tomb at Hazarat Begum is said to contain the remains of Hazarat Sultan who about nine hundred years ago defeated the Chinese near this spot, and established the religion of Mohammed in Sin-Chiang. My purpose was simply to determine the true position of those tombs; but hazy weather, obscuring both sun and stars, supervened, and, as I was unwilling to lose time, I continued my journey without interruption.

On reaching Yarkand, on March 14th, I found the animals which had been left in charge of Abdul Karim in excellent condition, and also two fine camels purchased by Raju near Kugiar for 1,100 tongas. Arrangements for

the hire of additional ponies were made with much difficulty, for, though there were many transport contractors (kerai kish) in Yarkand, they were unwilling to undertake any journey outside the well-known trade routes, especially such a journey as I proposed, over an altogether unknown region. I found also that many of these contractors had already made their arrangements for their annual journey to Leh, and had accepted large advances



GROUP OF YARKANDI TRANSPORT CONTRACTORS.

from traders for their prospective services, while the few who had not yet contracted had borrowed so much money that if they attempted to leave Yarkand, their animals would probably be seized for debt. Traders who engage the services of these contractors have generally to make large advances, sometimes amounting to complete prepayment, to enable the carriers to feed up their ponies, which are half-starved during the winter, and to make

suitable preparation for the journey. With this custom I was most unwilling to comply, because a transport contractor, knowing that he had little or nothing more to expect, would, in all probability, without hesitation desert me on the slightest pretext of danger or difficulty. After several disappointments I entered into a contract with Niaz Akun, who promised to supply me with twenty ponies at the rate of 6½ tongas each per march as far as Khotan, and the same rate per day, whether marching or resting, beyond Khotan, provided the caravan marched when I desired. For the return journey the payment was to be at the rate of 3¼ tongas per march from the place (wherever it might be) where he should be discharged. These terms were much higher than those usual in Sin-Chiang, but if the agreement was duly fulfilled, they would not be exorbitant. The contract was signed with much formality in presence of the Aksakal, Sidik Shaye, Pundit Boota Ram, and Munshi Bunyard Ali, who duly affixed their seals and signatures to the document. Then the force of custom constrained me, and I made an advance of thirty days' hire, or 3,900 tongas; but I had Niaz Akun's ponies and two fine donkeys stabled close to my own, so that I could see that they were properly fed and tended till the day of starting.

The old pack-saddles and jhools had to be repaired and new ones made, and the yak dans (mule trunks) and canvas bags had to be carefully overhauled and replenished in the usual systematic manner with provisions for the journey. The men required an outfit of clothes, and to prevent the disappearance of the puttoo, I had personally to supervise the eight tailors whom I employed to construct the garments. Besides the warm and comfortable puttoo suits, each man was provided with a pair of Cawnpore boots of excellent quality, a long sheepskin coat, a flannel shirt, a cardigan jacket, a pair of cherooks or

native boots, a pair of pepucks or felt stockings, a sheepskin cap, a pair of gloves, a pair of goggles, one water-bottle, one haversack, and two Kashmir blankets, or two small numnahs. Between the caravan men at their repairs, and the tailors at their constructive operations, I had to walk to and fro encouraging or admonishing as occasion seemed to require. At other times I had to treat the sore backs of Niaz Akun's ponies, or find substitutes for some of my own whose condition was unsatisfactory. The process of bargaining was lengthy and tedious, for custom required that two *dalals*, or brokers, should take part in the haggling, which was carried on in a mysterious manner, the seller sometimes putting his right hand up Raju's right sleeve and indicating the price by a touch of his fingers.

On my return to Yarkand I had found Rabzung, a Ladaki, very ill with high fever from which he had been suffering for several days, and one afternoon he sank so low that he was insensible, almost pulseless, and apparently dying. With a spoon I administered some strong spirit, and he recovered so far that his pulse became perceptible. His malady I took to be enteric fever, and having had him placed in a tent by himself, I expected that one or other of the men would be willing to attend to him. But towards their sick comrade they all showed the utmost indifference, even Raju, a relation of his own, refusing to perform the services required. Guffar, the caravan cook, carried in food to him, but I had constantly to watch that my instructions for his diet were not infringed. His nursing was practically left to me, and after several weeks I had the satisfaction of seeing that the patient's condition was improving. His recovery was so speedy and so complete that in a short time he was able to do more than a fair share of the hard work which had to be accomplished.

One day I had a visit from Pundit Boota Ram, but remembering former dealings with him, I declined to see him. He was not offended, but went away and sent me repeated messages, requesting that I would give him what many Indians love, a letter of recommendation. He came to me again and "with bated breath and whispering humbleness," holding his hands palm to palm, shaking his head, and blinking with his eyes alternately, but never looking me straight in the face, begged me to believe that I was quite mistaken about his character. He denied having entered into any arrangement to my disadvantage, and offered to cash a bill for me at the rate current in Kashgar. Now, however, there was no difficulty in obtaining fair terms; the conspiracy had broken down, and I sold a bill at a rate about one-seventh higher than this man had offered a month before.

As the time drew near for setting out from Yarkand, various annoyances occurred. One man, Kunchuk, a Ladaki, requested his discharge on the ground that, being accustomed to live in a very cold climate, he found the weather so intolerably hot that it would certainly cause his death. The man was a hard worker and exceptionally intelligent, and I was very desirous of retaining his services. I paid no attention to his assurances that the heat would kill him, but tried to find out the true reason of his desire to leave me. In my service he fared much better than he did at home. He was well clothed and fed, receiving daily rations of meat, and he was paid twenty rupees per month; yet he preferred to go back to Ladak to live on suttoo (parched barley, ground) and water. He mentioned as an additional reason for his resolution, his father's circumstances, his age and dependence, but probably his determination was due to dislike of Raju, who made him fag for the other caravan men, and as I could not persuade him to reconsider the matter, I had to let him go.

Then Niaz Akun's men became troublesome; they feared the dangers of the journey, declared they would not travel over an unknown country where they were certain to perish among the mountains, and flatly refused to leave Yarkand. Much patience had to be exercised, and a good deal of pressure brought to bear on them before they would listen to reason and consent to start.

Having been desirous of purchasing four camels, I had only obtained two, but when I was ready to start, it was announced that some fine camels were expected in Yarkand in a day or two for sale. After waiting two days in the hope of making a purchase, I asked Raju why they had not arrived, and he told me that they had not even been sent for. This happened two days before a festival, and it was now declared that it would be unlucky to start until this festival had been celebrated, so that I had still three days to wait. Then to my regret I heard that Utam Singh, who, in October, had set out for Kashmir, had died at Gilgit, and I received news of an attack which had been made on the Swedish missionaries in Kashgar. The Chow-Kuan of the old town, acting under instructions from the Taotai, it appeared, issued orders to the Begs to send him a petition against the missionaries. No one had any complaint against these inoffensive men, and the Begs were perplexed how to manufacture a grievance. After conferring together they enjoined the missionaries' landlord to get up a disturbance which might throw discredit on his tenants, or show that they were odious to the inhabitants. The landlord collected a crowd of loafers, the scum of the bazaar, who proceeded to demolish the outer wall about the mission premises, and were in the act of destroying the outer door when one of the missionaries, Mr. L. E. Högberg, coming on the scene, was set upon and beaten. News of the disturbance reached the British Agency and the Russian Consulate. Macartney

went at once to the rescue, accompanied by a few unarmed men, while M. Petrovsky despatched his Secretary with a few Cossacks. The damage actually inflicted was not very great, but the nature of this disturbance, got up by officials who professed to be well disposed to the missionaries, but unable to control the dislike of the populace, illustrates the methods of the Chinese. The missionaries' wives, Mrs. Högberg and Mrs. Raquette, found shelter for a time in the Russian consulate; but M. Petrovsky took no effective steps to secure the immunity of the missionaries from such attacks in the future, at least as far as I could ascertain.

At length, on April 25th, the caravan began its journey and I had the satisfaction of seeing my own section and that hired from Niaz Akun file out of Yarkand before ten o'clock in the morning. Then, that all my proceedings might be in perfect order, I went with Niaz Akun to the Yamen to bid farewell to Liu Ta-jin, the Chow-Kuan. Niaz Akun had many misgivings about this visit and showed both surprise and fear when I insisted on his accompanying me; but a few words sufficed to quiet his alarm. I wished the Chow-Kuan to have some personal knowledge of him and to be fully informed of the contract between us, so that there should be no appearance of concealment or mystery. The Chow-Kuan requested him to give security for his good behaviour by depositing a sum of money, or to produce some near relation who might be seized and punished in case Niaz Akun deserted me. These Chinese methods did not enter into my purpose, for, if security were given, it would probably never be returned, and if I were deserted there would be little justice in punishing any one but the actual offender. I therefore suggested a compromise: that the Chow-Kuan should refuse Niaz Akun a passport for Ladak until he produced one of my visiting-cards, signed and sealed by me, as evidence that

he had fulfilled his contract. This plan the Chow-Kuan adopted, and, having handed to him a signed and sealed card for the purpose of comparison, I took my departure. This visit was quite a success, for Niaz was greatly impressed by the threats of dire penalties in case of misbehaviour. This Chow-Kuan, Liu Ta-jin, contrasted very favourably with other Chinese officials with whom I had dealings. He was an able and energetic man, and only in one matter had he taken any step which could be regarded as unfavourable to me; he had never raised any objection to my travels, and he was always ready to restrain or to punish those who opposed my progress.

It was without much regret that I now turned my back on Yarkand and set out in the track of the caravan, which I overtook in the evening. The march to Khotan was uninteresting, and, owing to various accidents, it took longer time than I had anticipated.

On May 11th, the day after reaching Khotan, I paid my respects to the Chow-Kuan, and requested such assistance as he could give. At first he refused to help me in any way, or even to give me permission to go to Polu, but after many protests on my part he agreed to permit me to travel to Polu, though he refused to authorise the sale of supplies to me *en route*. Thus, while he seemed to allow my advance, he made it impossible for me to go forward; and when I found further conversation through two interpreters unavailing, I fired a parting shot, telling him that he and his brother official at Kiria robbed the gold-diggers, and that that was the reason why he obstructed my advance to Polu. No reply was made to this, but the Chow-Kuan promised to refer the matter to the Taotai at Kashgar, and consented to forward a letter from me to Macartney by specially urgent post which would take only eight days on the way, going and returning.

The Chow-Kuan's return visit was not paid on the same

day, as politeness required it should be, but on the following day, when he, while informing me with a show of goodwill that I might await the arrival of the reply from Kashgar at Polu, made it clear that he would render me no assistance. I produced my passport and asked him why he would not respect that formal document; but my remonstrance was of no avail, for he only talked round

THE CHOW-KUAN OF KHOTAN.

and round the matter, giving long explanations from which no information could be gathered.

It was clear that I must wait at Khotan, so, instead of delaying to make my purchases till I reached Kiria, I began at once to buy stores. Forage and corn being now scarce and dear, I followed the example of the natives, and, without any order, applied to the Government stores, where the surplus Government stock was being sold at prices much below those of the open market. My

application, however, was rejected, and I had to obtain special orders authorising the sale to me of stated quantities of Indian corn and chopped straw. My spare time was taken up with the inspection and doctoring of the ponies. To exercise the ponies and donkeys, especially the donkeys, still seemed beneath the dignity of the caravan men; Raju, now grown surly and troublesome, tried to escape the duty, and others drew the line at the donkeys, which were left to the care of the most newly engaged men. Then Niaz Akun became discontented, for, according to the contract, he was not to be paid for days spent in Khotan. But the contract was nevertheless a very favourable one for him, and his threats to leave me gave place to humble penitence when I made the counter threat of seizing his ponies. The Chow-Kuan, who was well known to be opposed to my journey, had deputed a Beg to attend to my wants, and by promising a reward of sufficient amount I had converted the subordinate official into a useful friend, who assisted me to hire fifteen donkeys as far as four marches beyond Polu. Having in vain waited for eleven days for Macartney's letter, I arranged to leave Khotan on May 22nd. Islam and Ipay, the camelman, I sent with the two camels to make a *détour* by Kara Sai to Baba Hatun, as the Polu route was impracticable for these animals; and Abdul Karim I despatched ahead to Polu with hired animals carrying the corn, for the further transport of which sheep were waiting.

Our advance was difficult owing to the hot and dry weather and the clouds of dust, which, consisting of fine sand and loess, penetrated the gauze of the goggles and temporarily injured the eyes. When we reached Kotaz Langar on the edge of the desert, our first halting-place, the Beg, instead of sending us the usual present of a sheep, provided us with large blocks of ice, which were

most welcome, and next morning at daybreak I found Macartney's letter, which after a journey of five days had arrived during the night. In this letter Macartney informed me that, after a protracted interview with the Taotai, he had entered into an explicit agreement respecting me: that notice should be sent at the speed of 400 lis (about 100 miles) per day to the Chow-Kuans of Khotan and Kiria that I was free to travel by any route; that

A WATER CARRIER AT KHOTAN.

the inhabitants of Polu should be told that they were at perfect liberty to enter into any arrangements they chose as to transport and supplies, and that the Chow-Kuan of Kiria was to afford me due protection as long as I was within his jurisdiction. This was exactly what I wanted, but still the doubt remained whether this agreement would be carried out.

Soon after setting out from this place we were over-

taken by a sandstorm, which attained a steady velocity of twenty to twenty-five miles an hour. The air became thick with minute gritty particles which, while almost blinding us, overspread the tracks already ill-defined, so that it was exceedingly difficult to avoid straying. For a time, while leading Niaz Akun's caravan, I could not distinguish the proper route, but fortunately the wind abated somewhat, and I was able to recover the track. At Nura we saw a pony which was so old that, though in the midst of abundance of succulent lucerne, he was unable to eat it and was dying of hunger. The animal belonged to the wealthiest man in the place, who left it to suffer simply because he saw no profit to be derived from killing it. After directing some reproachful words to him in the presence of many of the villagers, I obtained his consent to my proposal to end the sufferings of the aged animal, which thereupon I promptly shot.

At Polu, where I arrived on May 30th, I found waiting for me a Sia, an important official, who had come with his interpreter from Kiria. He told me that he had been sent by the Chow-Kuan of Kiria to make sure that I should get no assistance in travelling to the mountains of the Polu gorge. He was a most disagreeable man, but to all his assertions and arguments I gave one reply, insisting on the performance of the agreement which had been made between Macartney and the Taotai. The interview was protracted and stormy, and at its conclusion the Sia informed me that he meant to stay in Polu as long as I did.

The route by which Islam and the camels would travel from Kara Sai to Baba Hatun I ascertained to be much longer than I had supposed, and I preferred to spend the time at Polu rather than to wait at Baba Hatun. Sending Mohammed Joo to Kiria with a letter of remonstrance to the Chow-Kuan, and with instructions to

borrow money for my use, as my stock of Chinese coin was at a low ebb, I betook myself to the inspection of my sheep. Of the 94 which I had left with Nurbu in September, 14 had died and 32 were unfit for transport work, so that it was necessary to purchase fresh animals. All the flocks in the region were now very thin and many animals in bad health, and it was with the greatest difficulty and after rejecting many scores of sheep that I was able to raise the number of my transport flock to 130. Then the new animals required some training, or at least had to be accustomed to carrying loads and to being tied up at night. We had more ammunition than we could conveniently carry, and we found time to reduce the quantity by giving the men who seemed capable of handling firearms some practice with the carbine, while Ram Singh, Abdul Karim, and Dass were initiated in the use of revolvers, though only Abdul Karim became a good shot. The time spent at Polu was tedious, our expenses were heavy, and our anxieties were increased by Raju, who became more lazy and troublesome, feasting with his friends on the rations served out for the men, and at the same time fostering discontent in the caravan.

Then the Sia adopted a more favourable tone and made many fair promises, so that I began to hope that by prolonging my visit I might obtain help in travelling through the Polu gorge. This appearance of yielding, however, was assumed, and his fair promises were made only for the purpose of temporising; after telling the Polu villagers plainly in my presence that they were quite at liberty to assist me, he let them know, when I was absent, that words spoken before me were not intended to be acted upon. My men informed me of this underhand system, and one evening when they knew that the Sia, in accordance with his habit, was stupefied with opium, a deputation came to me and stated that they dared not

help me so long as the Sia remained in Polu, severe punishments being threatened for every act done in my favour.

My Chinese money, supplemented by 100 sarrs borrowed by Mohammed Joo at Kiria, was only sufficient to pay my expenses for a few days more at Polu, and I was therefore obliged to hasten out of Chinese territory by the shortest route, through the Polu gorge. Three days before setting out I sent three men to deposit chopped straw, corn, bread, and wood, some at a dangerous part of the route and the remainder at Kha Yak Day. While the abortive negotiations had been proceeding at Polu, Niaz Akun and his caravan were at Imam La, where forage was plentiful, and when I was making ready to resume my journey they returned towards Polu. Heavy rain, however, was falling, and the Kurab River at Polu was much swollen, so that Niaz Akun and two of his men in crossing had a narrow escape from drowning. Niaz Akun ought to have seen that the ford, which was becoming more dangerous every minute, was impracticable, but he persisted for a little longer in his attempt to bring the caravan to the Polu side. A strongly built pony he had just ridden across became very restless at being separated from his companions, and, breaking loose, plunged into the foaming torrent to rejoin them. He was speedily swept off his legs, and in a few seconds was carried down the river for several hundred yards to a bend, where he managed to regain his feet so as to be able to rejoin his companions. Both Niaz Akun and the other men were indifferent to the fact that those on the further side of the torrent were soaking wet, hungry and without shelter, fuel, or supplies. Notwithstanding Niaz Akun's scouting of my efforts, I set myself to devise means to transfer some wood and one night's provisions for their relief, and for this purpose I used two lengths of Alpine

rope which had seldom been used before. A short distance below the ford the river narrowed, while the banks there were much higher. At the edge of the rocky bank I erected a pair of shears made of two baulks of timber and some rope of the country; this structure was kept steady by means of guys, and, the stouter rope being passed over it, food and fuel were hauled across to the opposite bank.

When Niaz Akun's men had thus got supplies for the night I went back to my own quarters, turning over in my mind the question of how to get rid of Raju. It was a delicate matter, for if he were formally dismissed he would certainly do his utmost to draw away the men, and new men could not be found at or near Polu. I told Ram Singh, who, in common with all the men except Guffar, cordially disliked him, that, owing to the opposition of the Chinese, I feared I would have to return to Khotan, and Ram Singh, of his own accord, repeated my words to Raju, so that when I consulted him on the same matter and asked about a route to Kiria I wished to explore, he was not taken by surprise. Then I instructed him to go to Kiria where he could borrow enough money to pay his expenses to Yarkand, whither I enjoined him to proceed and forward by the Indian traders' postman to Kashgar a roll of paper which I spoke of as an important map. Fortunately, the balance of pay due to him was very small, as he had obtained a large advance at Yarkand, and I was therefore not required to reduce my small stock of Chinese money. When Raju had set out I told the men they were to obey the orders of Mohammed Joo, and we set about preparations for immediate departure.

CHAPTER XIX

Heavy rain—Fresh animals—Hard work—Death of Kasim—Snow-storms—Driving sheep—Loss of baggage—Bleak bivouac—Saroz Kul—Ponies strayed—False alarm—Amban's "kind" orders—Sickness—Meeting Islam with camels—Camp 110—Ram Singh still unable to work—Imperative to abandon journey—"Caching"—Return to Ladak—Meeting Europeans again—Green fields—Leh—Disposal of caravan—Pleasant march—Srinagar—Simla—Hospital—Kind visitors—Homewards.

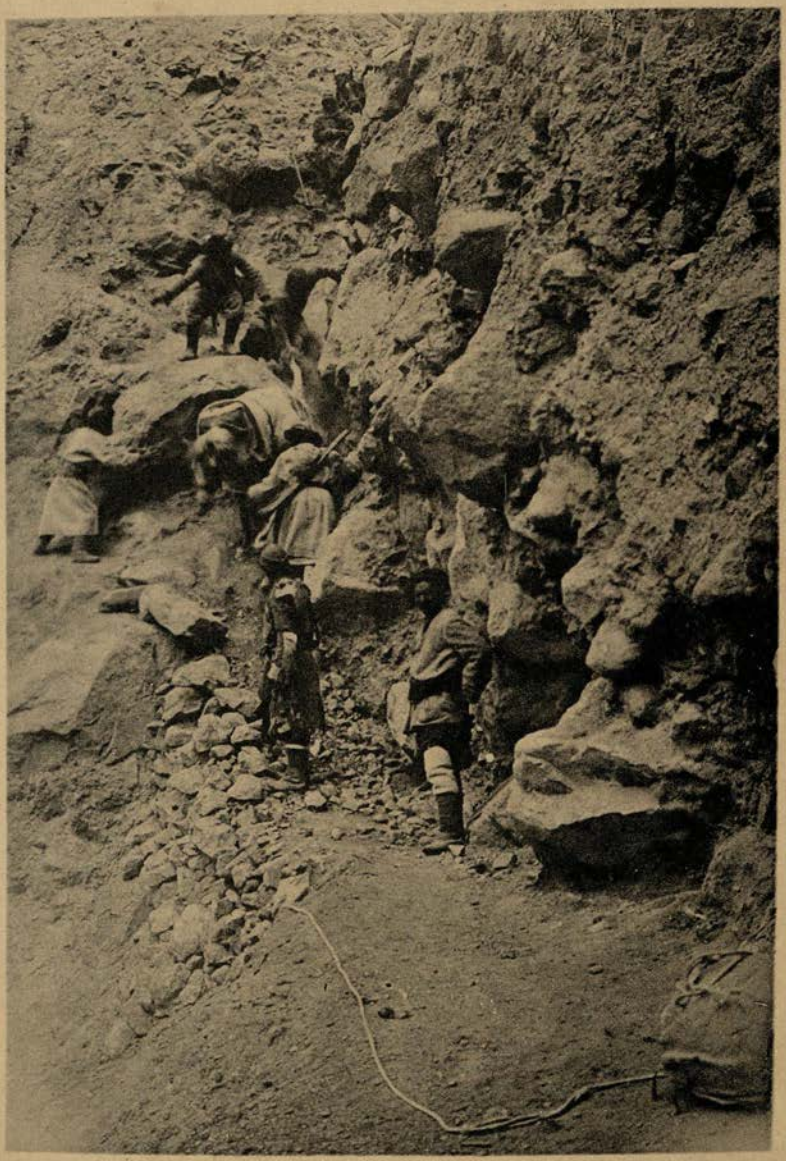
AS it would be impossible to get all the animals past the worst parts in one day, I sent Niaz Akun with his section of the caravan, and the two shepherds Nurbu and Stanzin with the sheep a day's march in advance. Then I received the last visit of the Sia, who finally refused to carry out the agreement which I have already described. The Sia went so far as to say that it was Macartney's wish that I should remain at Polu till the road was repaired. What the repairing might mean I did not then understand, but it seemed to me that the effrontery which could attribute to Macartney the wish to detain me would stick at nothing, and, turning to go, I told the man plainly that he was a liar, a statement which did not in the least ruffle his temper, for when I left him his countenance wore the bland smile peculiar to the Celestials.

On June 13th I set out with the men and animals which had not already gone forward. The caravan,

exclusive of Niaz Akun's section, consisted of 29 ponies, one mule, 26 donkeys, two camels, 140 sheep and goats with 13 men, mostly Ladakis, for drivers. Our supplies of flour, rice, biscuits, bread, tea, ghee, tobacco, salt, and spices for the caravan and myself with some small luxuries for my own use weighed about 3,000 lbs. or about 1·34 tons, and at the rate of 1½ lbs. per day for each man, exclusive of rations of fresh meat, would last for 115 days or rather more than sixteen weeks. Besides these stores, we carried, of course, cooking utensils, bedding, clothes, instruments, medicines, arms and ammunition, cash, a large stock of grain, and a variety of articles which scarcely fall under any of these heads, so that the transporting of our luggage was a serious matter.

Not one of the villagers came to give us a send-off, but, though rain was falling, we were joined by a petty official, whose duty doubtless was to prevent the villagers from giving us any assistance. Ram Singh, Abdul Karim, Dass, and I were nominally provided with riding ponies, but when leaving Polu all were on foot, except Ram Singh, who rode my pony. All the animals were fresh, and as the ponies kicked and scampered about, unsettling their loads, they gave us much trouble. The solitary mule always kept aloof from the ponies, and marched sedately with the donkeys. I did my best to help the caravan men, and walked in front leading a string of ponies, the heads of those behind being tied to the tails of those before. When we reached Alajoi, where the young corn was green and tempting, the animals rushed from the track to feed on the fresh stalks; and though it was impossible to keep them off altogether, the villagers seemed quite unconcerned, never even approaching to protect their property. Further on, where there seemed no temptation to leave the beaten track, the ponies would insist on having their own way; and when a group, tied

together, chose different tracks the result was embarrassing. A few miles above Alajoi we camped for the night on a small piece of level ground on the right bank of the Kurab River, where there was grass but no fuel. In the morning the rain was still falling, and our clothes were as wet as they had been the night before; but our tents of millerained cloth absorbed scarcely any moisture, so that we did not require to wait till they dried before packing them up. The animals could not all be loaded at once, and those which were first ready, instead of waiting patiently for the others, went off to visit their companions. The ponies galloped off, kicking and fighting with each other, while the donkeys quietly lay down and tried to roll over on their backs. These proceedings were trying to our tempers, but at length a start was made up the narrow, stony valley on a track where there was barely room to march in single file, and where trouble constantly arose. The loads of the animals would shift and require readjustment, or a pony would get into some awkward predicament, from which it could be extricated only with danger and difficulty; or the mule would run back from the donkeys for a long distance, going faster and faster the more rapidly he was pursued. I found that Niaz Akun had not got all his section of the caravan over the most difficult part of the track when I came in sight of him, but I could give him no help nor even pass the laden donkeys of my own section, for these were huddled together on the declivity leading down to the gorge on the further side of which I was to spend the night. Abdul Karim and Rabzung, zealous and hard-working men, rearranged, as they had done often before, the loads of the donkeys, and drew these animals to a spot where one could pass them without falling down the mountain-side. Though our course lay up the valley, the track here led by a very precipitous descent down to the



DANGEROUS DESCENT IN THE POLU GORGE.

bottom of the gorge. Laden donkeys, patient and sure-footed though they are, cause considerable trouble when travelling on steep ground, for they plant their hind feet so very close to their forefeet that, no matter how tight the breeching and additional ropes are made, the saddles and loads constantly slip forwards to their necks. When we reached the bottom we had at once to make preparation to scale the opposite bank, and in this labour we had the assistance of two men, whom we had met soon after leaving Camp 163. The animals had to be unloaded; the baggage had to be carried by the men up the steep rocky slope; then the animals had to be helped up and reloaded where the track was again sufficiently broad. The labour was difficult and dangerous, and when the worst of it had been accomplished, we looked for ground suitable for the night's quarters. Our bivouac was long and straggling; some of the baggage was still at the foot of the rocky ascent; the donkey loads were deposited on the top of a high steep ridge where there was some good grass, while some of our belongings were set down beside a large shelter formed by boulders. Leaving my section of the caravan, I went forward to reconnoitre and help the men; and when, after dusk, I returned, I found Ram Singh and Dass levelling a place for me to sleep on. These men, however, rarely made the best use of their surroundings, and I had to look for a spot where I might hope for some slight shelter from the driving sleet. Having levelled a piece of ground where the steep cliffs afforded a little protection, I set up a box and the camp-table so that they would shelter my face, at least until the direction of the wind changed. In the gorge Sonam had "cached" supplies, so that we had abundance of food; and when I had partaken of the food which Dass had prepared for us, I was glad to take off some of my wet clothes and seek sleep.

After a long day of unusually fatiguing labour I was ready for repose, and, having enjoyed a hot meal with refreshing tea, I slept soundly, untroubled by the cold, raw air or the heavy fall of sleet to which I was exposed. In the morning we rose with daylight, and having packed our bedding and warmed ourselves with hot tea, we resumed our task. I was leading forward a couple of excitable ponies, when I heard one of the new men

Sonam Sang. Sonam.

TYPES OF LADAKI CARAVAN MEN.

calling after me, "Sonam, Sonam!" Sonam Sang, who was near me, went to find out what was wrong, and, to my alarm, shouted to me across the valley that Sonam was killed. Sonam had been a great friend of Sonam Sang, who, when he had announced his death, covered his face with his hands and wept. For my part I was both grieved and angry, for here was the direct consequence of Chinese opposition, and I gave

vent to my feelings with "curses not loud but deep." As soon as I was disencumbered of the ponies, I went to ascertain how the accident had occurred, and learned that it was not Sonam but Kasim that had been killed. When I reached the spot I peered over the edge of the precipice, and saw Abdul Karim standing beside the lifeless body. Kasim had been tightening the rope which fastened a pony's load, but instead of doing so according to the standing orders as advised at the time by Sonam, with the pony turned across the track, he had pulled with his back to the precipice, and one foot against the load, so that when the rope broke nothing could save him.

Kasim was a caravan man whom I had engaged in Kashgar, a good worker, but an obstinate despiser of rules and regulations. With little experience in caravan work, he would never take advice from any of the other men, but would do things in his own way. On the day before the fatal accident he had, against the remonstrances of Abdul Karim and others, tried without help to take a laden pony over the most difficult part of the ascent, with the result that the pony just escaped being killed.

As we advanced we had to face blinding snow and sleet, but at length reached Kha Yak Day, where we overtook Niaz Akun's section of the caravan, from which one pony had been lost by a fall from a cliff. The pitiless and blinding sleet continued; the men were cold and wet, and the cold and hungry animals were driven from place to place in search of food and shelter which did not exist. We found fuel enough to boil the water for tea, and there was a small cave of loess, round the mouth of which I made a barricade of boxes and sacks so as to form a shelter against the snow. This place of rest was just large enough to lie down in, not high enough to sit up in, but I had to share it with some of my sheep and goats, which would not be turned out.

I wished to retain the services of the two new men; and although, through Mohammed Joo, I offered them wages many times greater than they could possibly get otherwise, they declined all overtures, and returned to their own land.

Being doubtful whether water could be obtained close to the north side of the At To Pass, I set out early in the morning to make a search. On my way I saw one very obvious effect of the rain and sleet: the stones, loosened by the superabundant moisture, rolled and bounded down the mountain-sides in showers, from which it was at times necessary to take shelter under the cliffs. On overtaking the two men who had been sent forward with the transport sheep, I sent back Stanzin, who had been accustomed to caravan work, and I endeavoured to take his place. The work of driving sheep was new to me, and, simple though it may appear, I found it very difficult. The animals, hungry and scared by the falling stones, could not be made to go forward, but remained huddled together in the bottom of the narrow valley, in spite of all my shouting and pushing and stone-throwing. Recognising that sheep-driving was not my proper vocation, I left them to Nurbu and went to look for water. My search was fruitless, so that we had to halt in the valley at the furthest place where water could be found. By the time I had helped Nurbu to unload the sheep I felt weary, feverish, and too weak to return to the caravan. For several hours I spent the time in alternately looking for the caravan and seeking shelter in a dry but shallow water-course from the blinding snowstorm, while the tired sheep wandered about, bleating pitifully, searching for grass where no grass was to be found. Then Niaz Akun came up and reported that one of my ponies had fallen over the precipice and been killed. The pony, he said, was one which had carried money, and its load had

been shattered and carried away by the torrent. The accident, however, proved to be less serious: a pony laden with bedding and a small cane trunk containing a little money had bolted; the load had been caught by a projecting rock, and the pony precipitated over the very rocky mountain-side. Sonam, in a gallant but unsuccessful attempt to save the pony, had been kicked in the face and had many of his teeth knocked out. The bedding was found uninjured, but the cane trunk was smashed and its contents scattered. The low banks of the dry water-courses, which ran so as to form a sort of delta, afforded some slight protection from the sleet, but the wood we had for fuel was damp, and there was difficulty in getting hot water for tea. The men, however, did not pass this cold and cheerless night supperless; but the animals received nothing more than a small feed of corn.

Next morning the weather was good, and in a few hours the sun shone brightly. Giving my riding pony to Ram Singh, I went with Rabzung to look after the donkeys; for in the ascent of the At To Pass, their loads constantly slipped back, and, when we reached the summit, they had to be rearranged for the descent. The surrounding mountains, covered with snow to their bases, presented an aspect very different from their appearance in September, and it was not easy to guide the caravan by the direct route to Saroz Kul, which was invisible till we were within a few miles of it. I had hoped to halt at Camp 115, but there was no water near that spot, and we pitched our tents between low mounds of whitish clay close to Saroz Kul. Both Ram Singh and I had begun to feel the effects of the exposure and hardship we had undergone since leaving Polu. The temperature of the air was only 33° F., but our bodies had abnormally high temperatures, though at 9 p.m., when I retired for the

night with all my clothes on, I could not get warm till I had dosed myself with Dover's powder.

In the morning we found that some of the animals had strayed and it was necessary to remain in our present quarters for that day, but we found some good grass at a little distance from the camp. About a mile off were some low hills whence the site of Camp 115 could be seen; but I was too weak to walk to those hills, and in returning from the attempt I became so tired that I had to rest several times.

On the next morning eight ponies and four donkeys were missing, and parties were sent out to search for them. Abdul Karim had not gone far when he sent back for his sword and carbine, saying that he had seen men hurriedly driving away the donkeys. Many ponies happened to be in the camp being shod, and no time was lost in sending help. Rabzung, the lightest and boldest rider left behind, was sent with arms and ammunition to Abdul, while I, accompanied by Ram Singh, Mohammed Joo, and Niaz Akun, armed with carbines, set off in pursuit of the supposed robbers. Owing to the thinness of the air, my strongly-built and well-bred pony was unable to go at a faster rate than a slow trot, the ground sloping gently upwards in the direction we were going. The men driving off the donkeys at first hastened away when we came in sight, but, being alarmed at our carbines, they halted and told us who they were. They turned out to be natives of Kiria returning from a temporary post which had been formed near Aksu. When we and they were satisfied, they returned with us to Saroz Kul, and the Chinese official who had command of the small expedition told me what his orders were. A temporary station had been formed at Aksu to demonstrate to me that I was on Chinese ground; my efforts to travel thither by the direct

route had met with obstruction; but facilities had been provided for my travelling by the Kara Sai route. Now that I had traversed the short route, these men were commanded to destroy it, and they received orders also to keep a strict look-out for troops and travellers coming from Ladak, and to send as speedy notice as possible to Kiria of their approach. The Chinese evidently considered that my purpose, instead of being strictly geographical, was political or military, and that I was bringing supplies for troops advancing from India by Ladak to Polu. Even the ignorance respecting other nations shown by the Chinese officials in Sin-Chiang will hardly account for this dread of invasion from India. Probably M. Petrovsky imparted to the Taotai at Kashgar the notion that the Indian Government desired to open up the route nominally for trade, but really to prepare the way for troops to take Polu, Kiria, and other towns. The Russian Consul-General could scarcely believe in the existence of such a purpose, but, absurd and impracticable as it would be, it would not be too much for the ignorant credulity of the Taotai. "Information" concerning British schemes supplied by M. Petrovsky would, moreover, be interpreted as "instructions" or "orders" to the Taotai, and they would be acted on with the design of opposing and thwarting British travellers, though their journeys could not possibly affect Russian interests.

The severe weather, scarcity of grass, and unusual exertion ever since leaving Camp 163 had been trying for the sheep, and several of them had died or had become so weak that they had to be slaughtered. It was now the middle of June and yet no new grass was to be found. In the narrow part of the valley above Aksu, better known as Chadder, ice and snow had collected thick and deep, apparently indicating that the winter had been more

severe and prolonged than usual. The contents of the medicine chest were now in constant demand; fever, rheumatism, headaches due to rarefaction of the air, were common, and when we reached Baba Hatun, I was so weak that, having left the camp to search for water, I was unable to walk back. The natives of Sin-Chiang who accompanied me were accustomed to live at an altitude of not less than about 4,000 feet, yet, owing to our high elevation, several of them suffered frequently from headaches and constipation, and they could not keep up with the slow-going caravan, while I, accustomed to live but little above the level of the sea, was never seriously affected except that I breathed more rapidly.

At Baba Hatun we found Islam and Ipay, who had, with the two camels, been waiting for us for several days. They had experienced severe weather, one of the camels having become so thin that it would have been useless to take him further. This animal I gave to the Kara Sai men who had brought me about 500 lbs. of corn, besides barley meal, and I supplied them with enough Indian corn meal for the camel till they should reach their home. Near Kara Sai there would be plenty of excellent feeding for him, and probably they would be able to sell him in good condition for a high price in the autumn.

The weather for some days was threatening, and by the time we reached Togral Monpo (Camp 111) it had become much worse. When close to the pass we had to abandon thirteen sheep, and we had barely pitched our camp when we were overtaken by a blinding snowstorm which continued all night, and, in a milder way, during the next forenoon. Such a storm speedily scatters a caravan, driving the hungry animals far and wide in search of shelter. After the tents were set up, the caravan men, cold and wet, huddled together within

their tent or under a tarpaulin; for the boortza, the only fuel, was so damp that it was long till a hot meal could be provided. Several of the ponies, doubtless owing to the great height, ceased to eat even corn, and one which had been off his food for several days died on the second night at this camp, 17,350 feet in altitude. It was not till near the end of the second day that all the animals which had strayed in the snowstorm could be recovered.

At Camp 110, men who had been sent to Yeshil Kul for salt rejoined us, but without having found any. The supplies of that article, which had been abundant at the lake in the autumn, were now apparently nearly all submerged, but Mohammed Joo returned and succeeded in finding as much as filled one of our flour bags.

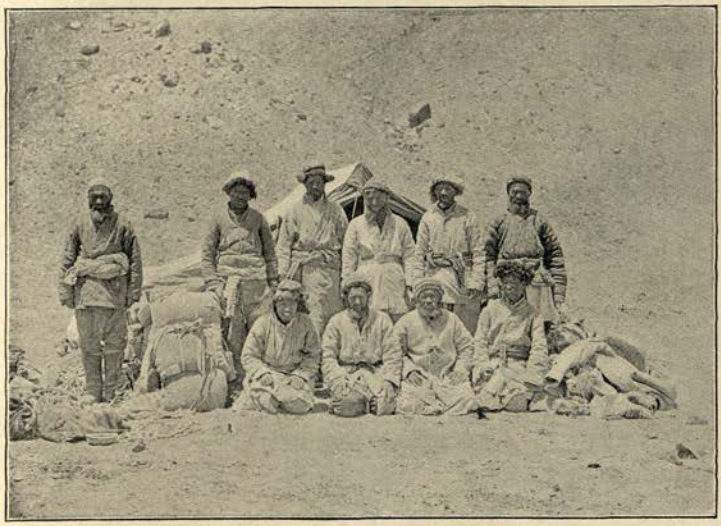
Things were not now going well with us. I was quite unable to walk all the way from Togral Monpo to Camp 110, and Ram Singh who, for thirteen days, had suffered from abnormally high temperature, with pains in his feet and shoulders, was now too ill for work, and derived no lasting benefit from any medicines that I administered. We could not prolong a journey which was serving no good purpose, and it became more and more evident that the proper course was to make for Ladak. Some miles from Camp 110 we selected a suitable place to "cache" the food and other supplies not required for our journey to Leh, dug a deep trench in the stony ground, and deposited load after load, carefully making a list of all the articles. Over the yak dans, boxes, and sacks we spread our tarpaulin, and covered the whole with a thick layer of stones and earth so that probably no one outside our own company could discover this valuable depôt of foodstuffs. Then disappointment and dejection overtook me, and I wearied myself thinking of the expenditure of time and means in preparation now absolutely useless. I was the only member of the caravan who was depressed; others

rejoiced that they were going home, and Niaz Akun offered to accept his discharge without payment for the return journey, an arrangement which, being equitable from the point of view of either party, was agreed to.

We now advanced, little cumbered with luggage, as fast as we could travel, towards Ladak, and I was able to guide the caravan to the Lanak La without once looking at the map. The march was a most dreary one for me, for I was feverish and in bad health, with no purpose save to reach my journey's end. At the conclusion of the daily march there was nothing for me to do but to help in pitching the tent, which was rarely used, to write a few lines in my journal, and to make an attempt to eat some dinner. Milk I had none, and my diet, such as it was, consisted of soup, rice, tea, and occasionally a little meat. About eight o'clock I retired for the night, usually stretching myself out in the open air. Before reaching the Lanak La I considered the probability of meeting some sportsmen in Chang Chenmo, and, soon after crossing the pass on July 10th, my spirits rose at the sight of a small caravan of yaks approaching. The Ladakis assured me that the caravan must be that of some European, for only sahibs visited such a desert place as Chang Chenmo, and when, after unloading my donkeys, I sent to ascertain whether any sahib was near, I was delighted with an affirmative reply. The traveller proved to be Major Graham, R.H.A., who had been quartered at Lucknow at the same time with myself several years before. It was with great pleasure that I accepted his invitation to cross the valley and share his hospitality. The next European I met was also a personal friend, Captain Lachlan, R.A., with whom I marched two days. After I had crossed the Chang La my eyes were refreshed with the rich green of the crops in the Sakti valley, for a long sojourn among barren hills and sandy deserts

gave me a keen appreciation of the beauty of fertile land.

On July 21st I reached Leh, tired, dusty, and thirsty, and entering the stores of a Hindu trader who was acquainted with European tastes I asked for beer, a beverage which I had not tasted for two years. "A pint, or a quart?" he asked. "Pint be d——d; bring me two quarts to begin with," I replied.



MY CARAVAN MEN.

My short stay at Leh was enlivened by pleasant intercourse with new acquaintances, among whom were Captain R. L. Kennion, the energetic and hospitable British Joint Commissioner, the members of the Moravian Mission, and Captain and Mrs. King, of the Royal Irish Regiment.

It was with regret that I bade goodbye to the caravan men who had been my companions in my wanderings,

especially the four men who had been with me in 1896. All of them had worked hard and endured many privations without a murmur. Though they were naturally destitute of fighting courage they had never hesitated to risk their lives on dangerous tracks and breaking ice, nor had they ever shown any desire to quit my service even when they knew that my route was across mountains quite unknown to them. Whatever may be the general reputation of Ladakis, most of those of whom I had experience served me well in the most trying circumstances of country and climate. In parting with them I distributed amongst them many of the animals which it had taken much time and trouble to collect, selling the few which I did not thus dispose of.

The march to Kashmir was performed without trouble, thanks to the excellent arrangements for transport and supplies at each halting place, and I was fortunate in having the company of Major L. Graham and Captain Riccard.

On reaching Srinagar, from which I had been absent about two years, during which I had covered more than 5,300 miles with a caravan, I felt rather ashamed of my general appearance, for I was in a very rough and unkempt condition, with a coat torn, worn, patched and stained, and I attempted, unsuccessfully, to slip unperceived into the dak bungalow (State rest house).

To avoid the heat of Dehra Dún and the Punjab in August, I went to Simla, intending to recuperate for a few weeks, but, being overtaken with a combination of maladies—malarial fever, congestion of the liver, sciatica, rheumatism, and gout—I was detained for two months in the Ripon hospital, where I was carefully tended by doctors and nurses. The weary days of sickness were enlivened by visits of many friends, whose bright faces, kind attention, and pleasant, cheerful talk I shall always

gratefully remember. As soon as I was permitted, I set out for Dehra Dún, to which I travelled by easy stages, stopping at Umballa to visit friends in my old regiment, the 16th Lancers, and journeying slowly in a dak gharry from Saharanpur to Dehra Dún. There I was able to explain doubtful points to the officers and computers of the Trigonometrical Branch of the Survey of India, where my maps were drawn and published. After a brief stay at Bombay I embarked in a French steamer for Marseilles, whence I hastened to England, and on December 7th, after an absence of two and a half years, I reached London so weak in health that I was scarcely able to crawl.

CHAPTER XX

Administration—Cost to China—Unpaid officials – Squeezing—Taxes —Forced loan — "Justice" — Prisons — Paupers — Irrigation— Slavery—Agriculture — Industries — Minerals — Trade—Money-lenders—Transport animals—Post—Telegraph.

THE province of Chinese Turkestan is officially called Sin-Chiang (or the New Dominion), but this name is practically unknown among the inhabitants, who are content to describe themselves as natives of the several districts, Yarkand, Khotan, &c. The principal personage in the adminstration of the province is the Futai, or Governor, who is always a Chinese and has his official residence at Urumtsi. Next to him in rank are two Taotais, one of whom resides at Kulja, and the other at Kashgar, while under them there are Chow-Kuans (by Europeans commonly called Ambans), who may be regarded as district magistrates. The Taotais and Chow-Kuans are Chinese; but most officials of lower rank are usually natives. The principal of these are the Begs, and, in towns only, Aksakals, or heads of trades, Mohammedans, wearing Chinese dress and false pig-tails. Then come the Ming Bashis, or heads of thousands, the Yuz Bashis, or heads of hundreds, and the Oan Bashis, or heads of tens. The Bashis are men in humble position who, not being required to make any compromise with Chinese usages, wear neither Chinese dress nor pig-tails.

The whole governmental system is rotten to the core, and every official, from the Futai down to the meanest Oan Bashi lives by systematic fraud. The officials are altogether unpaid otherwise than by plunder, but, since their right to "squeeze" is recognised, the amount of their income is limited only by their own discretion and the resources of their districts. Public offices are nearly always sold; justice is sold; the enjoyment of public

THE CHOW-KUAN OF YARKAND.

rights, such as water supply, can be secured only by bribes paid to the officials in charge, and there is no immunity whatever from exorbitant taxation, the proceeds of which go mostly to the private pockets of public officials. Sin-Chiang is a poor province, regarded as a sort of Chinese Siberia, and towards the cost of its administration other provinces of China contribute annually about 200,000 taels, yet the Chinese officials in

the province are understood to obtain by the various means at their command a good annual revenue. The Chow-Kuan of Yarkand, at the time of my visit, was believed by a competent authority to save about three-fourths of a lak of rupees a year, and when, after three years' residence, he left his former district of Khotan it was known that he took with him, amongst other savings, 237 sarrs of gold (the sarr in weight = the tael), 983 yamboos, 4,100 sarrs of silver, 43 yamboos' worth of corals and kimkab, and a pony's head of jade, the total value being not far short of 200,000 rupees. The Chow-Kuan of the small and poor oasis of Kiria, after not more than fourteen months' administration of his district, had saved about 850 yamboos, or over half a lak of rupees, and 90 sarrs of gold. In the summer of 1898 this worthy received intimation that he was to be relieved of his office, and he at once resolved that he should not go empty away. He issued stringent orders that no gold should be sold to any one but himself, and that the price should be 400 tongas per sarr. This was about 50 tongas less than the current market price ; but even so the purchase-money would suffer further diminution in its passage through the Yamen, where some officials considered they had claims on it. These orders were not mere formalities, for heavy penalties were threatened for violation of them, and officers were sent to the gold diggings in the district to note the names of all persons leaving, and the quantity of gold in their possession, while others were stationed on the road to Khotan, where a fair market price could be obtained, to search all travellers and their baggage for gold. Nominally this compulsory sale of gold was for the benefit of the Government, but really for that of the Chow-Kuan, who, besides enriching himself by purchasing at a low price, would be able to convert a large part of his savings into

gold, which could be easily and cheaply transported to China.

What official salary the Futai may receive I do not know, but it seems probable that for the greater part of his revenue he is obliged to make his own arrangements. In the autumn of 1898 many residents in the Yarkand Oasis sent a petition to the Futai, requesting the removal of Liu Ta-jin, the Chow-Kuan. Liu Ta-jin, however, promptly despatched his son to Urumtsi with a gift of 100 yamboos to the Futai, who was of course pleased with the giver and dismissed the petition. The Taotais of Kulja and Kashgar are mainly dependent on their subordinates for their income, and consequently exercise a wise toleration, refraining from issuing orders which would reduce the amounts of presents for which they look.

Most of the higher offices are filled by purchase, the purchase-money going, either in a lump sum or in annual instalments, into the pocket of the official who makes the appointment, and consequently able men who cannot or will not pay the expected bribes are left unemployed. One Chinaman who impressed me as being a man of great ability was thus debarred from the public service through lack of means, and another, a man who had served in China under Gordon, failed in his applications for employment because he would not conform to the habitual bribery. Chinese officials either are, or pretend to be, ignorant of the language of Sin-Chiang, and invariably employ Mohammedan interpreters. These men are paid at the rate of 3 sarrs in money, and about 155 lbs. of corn and 77 lbs. of flour per month, but they are not behind the Chinese in corruption. I have already mentioned the injustice of one interpreter towards the inhabitants of Tir with respect to grazing land in the Kulan Urgi valley, and similar cases were of frequent occurrence. A man who

had for a time been in Macartney's employment obtained an appointment under Pan Ta-jin, the Chow-Kuan of Khotan, but had not been permitted even to see the magistrate till he had given a few sarrs to the interpreter.

In the collection of taxes "squeezing" is systematically employed. A certain sum is notified to the Chow-Kuan of each district as the amount which he must provide; but as there is no public intimation of this amount, the inhabitants have no means of checking the demands made upon them. The Chow-Kuans thus instruct the Begs to raise as much more than the regulation sum as they think the people will stand without making an outcry. The Begs, being unpaid, have to arrange for their own interests, and they instruct the Bashis who do the actual collecting to levy more than the Chow-Kuans have asked, so that when the Bashis have added something on their own account the burden on the taxpayers is a heavy one.

The principal tax, the Yushur, or Yuzhur (literally, one-tenth part) is levied on land which is classified under the headings "aral," or well-irrigated land, and "ak," or white land, the land under each of these headings being of three qualities, which are taxed at different rates. No allowance is made for official errors in valuing the land. The tax is generally paid in kind, the recognised products being rice, wheat, Indian corn, chopped straw, wood, and dried lucerne. It is not unusual for the officials to reject the produce offered on the ground that it is of inferior quality, until a "present" is tendered along with it, after which all objections are withdrawn. In three of the fourteen Begdoms of the Yarkand district the land-tax is paid in cash, and, though there is a certain authorised rate for the conversion from kind to cash, the actual rate at which it is effected is about 31 per cent.

higher. The overcharge is still further increased by the simple expedient of requiring, in payment of taxes, 21 tongas, instead of 16, to the sarr or tael. The tax on sales of land is properly one-twentieth of the purchase price, but it really amounts to one-tenth, and is paid by the purchaser. The owner of each jewass, or oil press, has to pay 3 tongas monthly; the tax on rice mills varies from 1 to 2 sarrs annually, and that on flour mills from 2 to 10 sarrs annually, according to the output. Gold-diggers are taxed to the extent of one-third of the gold they find. A considerable revenue is derived also from taxes on sales effected in the bazaars or markets, the amount in Yarkand alone being from 75 to 95 sarrs per month. The tax, nominally one-twentieth of the sale-price, is paid by the purchaser when the subject-matter of the sale is living animals, but by the vendor in all other cases. Besides, there are taxes called Alban (pronounced Alwan), collected at irregular times for miscellaneous purposes, but concerning these I could obtain little information.

On March 28, 1898, the Chow-Kuan of Yarkand called all the Begs of the district together, and informed them that he had received instructions to raise a loan of 4,200 yamboos, or about £40,200 sterling, in bonds of two yamboos each for the purpose of paying debts to foreigners, presumably the Japanese. In ordering this amount to be raised he promised that the nominal interest of 5 per cent. would be paid to the holders of the bonds by deductions from taxes; but, on representations subsequently made by the Begs, the scheme was dropped as being beyond the resources of the population.

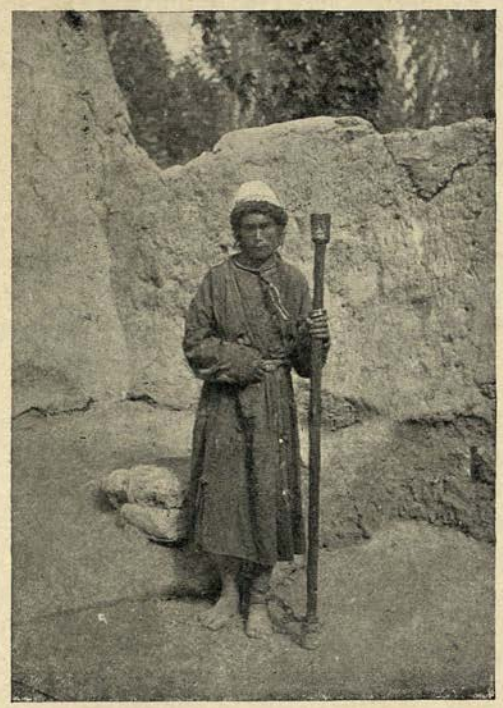
The administration of justice is carried on in accordance with the methods prevalent in other departments of government. In civil actions fees are exacted from the litigants, while in criminal cases fines are inflicted when

they are likely to be paid. Rich offenders are fined; the poor are beaten. Sentences of imprisonment are also passed, and for murder the death sentence. The Chow-Kuan of a district where a murder has been committed has to pay a fine of eight yamboos to the Futai and four to the Taotai of Kashgar or of Kulja; consequently, convictions of murder are comparatively rare. In the winter of 1898-99 a Beg in Yarkand was murdered by one of his sons, but the Chow-Kuan, Liu Ta-jin, excused the parricide on the ground that the accused was drunk when he committed the atrocity. The death sentence cannot be carried out till it has been confirmed at Urumtsi or Pekin. Many months elapse before the confirmation, but when this formality is complete the sentence is at once carried out, usually by decapitation.

In Yarkand I visited the prison, which is probably similar to those in other places. In was in two portions, one for men and the other for women. The portion for men consisted of three large rooms and a very small courtyard. The rooms were perfectly bare except that one of them contained a strong cage in which murderers and dangerous criminals were confined. In one corner of the courtyard was an open latrine, the odour from which was very strong and far reaching. The prisoners, according to regulations, should receive daily $1\frac{1}{4}$ lbs. of flour and about 2 lbs. of wood, but I was told that little or none reaches them, and that they are supported by their friends. The head gaoler, on receiving a small present for himself, consented to my giving to each of the prisoners several loaves, for which they seemed very grateful. The prisoners appeared indifferent to their surroundings, and, though clothed in mere rags, made no complaint. One little boy, said to be a thief, had a pitiably weak and starved appearance. Of the 55 prisoners, three were in irons, heavy rings round their necks being

fastened to handcuffs so that the range of movement of their hands was very narrow, while fetters were on their ankles.

Corporal punishment is usually inflicted with a short stick on the back of the bare legs above the knee. The prisoner is held with his face to the ground, and the



AN OLD OFFENDER.

blows, rapidly given, cause a deep discoloration of the skin, which breaks if the punishment is unduly prolonged. Persons convicted of minor offences are sometimes loaded with a board (the cangue) 26 or 28 inches square, and weighing about 27 lbs., which is carried about

their necks day and night for the prescribed time, in one case which I knew for thirty days. Old offenders are sometimes punished by having an iron bar chained to their neck and one leg for life. A man whom I met wandering about with a bar 5 feet long and 42 lbs. in weight was said to be an incorrigible thief, and he had certainly the most villainous face I ever saw.

On either side of the main entrance to the courtyard of the Yamen in Yarkand are two wooden cages, about $7\frac{1}{2}$ feet high, and about 2 feet square at the top, but wider at the base. The top consists of a board so constructed that it can be fitted about the neck of a prisoner. These cages were not used, so far as I could learn, during my stay in the town; but I was informed of their purpose by one who had seen criminals tortured in them. If a prisoner is to be tortured to death he simply hangs by the neck, a public spectacle till he dies. If the sentence is less severe, the supports are gradually withdrawn from under his feet till his toes can only touch them, and then he is left hanging by the neck to meditate for the prescribed time on the hard fate of transgressors.

In districts where crime is very prevalent, there are two Begs, one of whom attends exclusively to magisterial work. In large towns there are a few "darogas," or police under a Beg. At the gates of towns men are stationed; those at the main gate levy an unauthorised octroi duty; but for the maintenance of those at other gates each householder has to make a small payment.

Of serious crime the most common form in the winter of 1898–99 was robbery, and measures had to be adopted for the suppression of this nuisance. The orders issued by the Chow-Kuans of Yarkand and Karghalik seemed, however, even to the natives of the country, more troublesome to honest men than to robbers. All travelling after dark was prohibited, and if any wayfarer endeavoured to

continue his journey during the night the orders were that he should be arrested by the guards of the first village he entered. Every village and town was commanded to mount a small guard at dusk and to furnish patrols, whose duty was to rap at the doors and shout, "What ho! the patrol is here!" Old offenders caught stealing might be killed, and new ones also, if they stole over the value of fifty tongas. That part of the order

A GROUP OF BEGGARS.

which authorised the summary infliction of death was not taken seriously, as obedience to it would have involved the risk of a trial for murder.

In Yarkand as well as in Karghalik and Khotan pauperism was very conspicuous. In one of the dirtiest parts of Yarkand there was a collection of hovels provided by a paternal government for the poor. When I went to see this abode of misery it contained about one

hundred and thirty inmates, who were supposed to receive each a coat and a pair of trousers annually, and about 50 lbs. of Indian corn per month. Whether they received anything approaching that quantity I doubt, for I never saw so many people together whose faces so plainly told of destitution and hunger, or whose condition seemed so wretched with rags and dirt and vermin. The paupers supplement the Government contribution by begging or even stealing, often quite openly, food, fuel, and anything else they can lay hands on.

The natives of Sin-Chiang have a great respect for Europeans, variously known as Ferengi (Franks), Sahibs, and Urusse (Russians), crediting them indiscriminately with wonderful medical skill. If a European modestly and truthfully disclaims all knowledge of the healing art, or asserts that he has no medicine, he is regarded not as unskilful, but as unwilling to exercise his skill. Ordinary ailments are affections of the lungs and of the eyes, leprosy, tumours in women, and goître in some districts; but far more common than these is venereal disease, affecting, though not with great virulence, more than nine-tenths of the population. Notwithstanding the variety of their ailments, they classify them simply as hot and cold, and confidently expect relief in their affliction from any stray Sahib who comes their way. The only form of religion among the natives is Mohammedanism, but most of the professed followers of the prophet are very slack in observing his precepts. Wine and spirits are freely consumed, and morality can scarcely be said to exist.

A noticeable feature of the country is the system of irrigation. In the plains of the southern portion of the province rain rarely falls, but the oases are intersected with canals and watercourses fed from rivers flowing from snow-clad mountains. The curse of maladminis-

tration affects even the irrigation of the land, for the Begs and the Kuk Bashis, the officials whose duty it is to supervise the distribution of the water, use their power to oppress. They make no formal claim to payment, but unless large amounts are forthcoming they cut off the water supply. Besides the instances of such proceedings already mentioned I saw at Karghalik in April, 1899, the fields of Niaz Akun waterless and parched, while those of his neighbours were green and flourishing, the reason of the difference being that Niaz Akun could not or would not pay the amount expected. While in many places water is thus withheld, in others it is wasted, and the canals themselves receive less attention and repair than they require. The dry season is in spring, just before the mountain snows begin to melt, but it would not be difficult to provide a perennial supply. If large reservoirs were constructed and the irrigation system extended, as it might easily be, the arrears of many of the cases might be greatly enlarged. But for any such undertaking recourse would probably be had to forced labour or "hasha," for which payment is made only when it is long continued, and then not more than half the usual rate.

It is not generally known that slavery was abolished in Sin-Chiang so recently as 1897, over two thousand slaves having been liberated during the five years 1893–1897. This course of action was due to representations made by the British agent at Kashgar to the Indian Government, who authorised him to procure, at fair compensation, the release of all slaves who were British subjects. Macartney set about his task with so much zeal that he stirred up local interest in his favour and soon obtained the liberation, not only of slaves of Indian nationality, but of many others. The Chow-Kuan of Yarkand of those years set free about three hundred at his own expense,

and the Chow-Kuan of Karghalik, who was then in bad repute, and had been petitioned against by the people of his district, sought to regain favour with the Futai by releasing at his own cost all the slaves within his jurisdiction. When Macartney went to Khotan to urge on the work of manumission, he insisted on having all slaves examined, to ascertain whether any among them were from India. This process was likely to prove troublesome, and the Chow-Kuan, merely from a desire to save himself trouble, declared by public proclamation that all slaves in his district were thenceforth free. The Indian Government, which had thus, at a cost to itself not exceeding three thousand rupees, exerted a most beneficial influence, sent a telegram thanking the Taotai of Kashgar for his action, but sent it by way of the Tsungli Yamen at Pekin, whence, up to March, 1899, it had not been despatched. In what way Macartney's able conduct of the negotiations was acknowledged I am not aware. The work was accomplished unostentatiously and with no newspaper celebration, for little or nothing was said about the matter either by the Indian or the English press.

The chief agricultural produce of the country consists of Indian corn, rice, wheat, barley, cotton, hemp, tobacco, and vegetables. Oats are not grown. Fruits commonly produced are grapes, melons, peaches, apricots, plums, &c., while pears and apples are somewhat rare. European potatoes are rare, but the Chinese variety can be obtained in all large towns. A notion among the people that rain-water contains salt, and is therefore injurious to the crops, is probably derived from the fact that the ground in many places contains a good deal of salt, usually covered by the muddy deposit from the canal water, but exposed to view when this surface mud has been washed off by heavy rain.

The most widely diffused industry in Sin-Chiang is the weaving of a coarse cloth, the poorest quality of which, in texture, may be compared with a fine sieve. This cloth is used to make the garments of the poorer classes, but it is so inferior that it has to be doubled, and a lining of cotton wool inserted between the folds. The richer inhabitants buy Russian cloth, which, though of good appearance, is of poor quality and wears badly. In Sarikol a thick cloth is woven, but the output rarely exceeds the wants of the inhabitants. At Khotan cotton and silk carpets and numnahs or felt rugs are produced, and jade is cut and polished. These industries are in general carried on in the homes of the workers. Leather of poor quality, resembling brown paper, is prepared, and coarse paper is manufactured. For paper-making the bark of the mulberry-tree is boiled and mixed with wood ashes, then placed on a large stone and beaten into pulp. It is next put into a large cylindrical vessel sunk, for convenience, into the ground; a little water is added, and the whole is churned. When thoroughly mixed the contents are ladled into a fine cord sieve immersed in water, and are evenly distributed with the help of a cross-shaped piece of wood, rotated between the palms of the hands. The sieve is gently lifted out of the water and placed in a sloping position, so that the moisture which does not run off evaporates in the sunshine. The paper thus made is in sheets about double foolscap size, which are sold at the rate of 1 tonga 20 dachen per 100.

The only mineral worked in Sin-Chiang, so far as I ever heard, was gold, and the washing was carried on in a very primitive and careless manner. In watching the men and boys at work I observed that some of the precious metal was lost, but they only laughed at my solicitude in the matter. Then I washed some handfuls of their tailings and showed them a few bright grains of

gold remaining at the bottom of the cone-shaped wooden vessel, but, though they took the particles, they remained indifferent to their own shortcomings and refused to rewash the tailings. The method which was good enough for their forefathers was good enough for them.

Coal of very inferior quality is found near Kosarab, but the demand for it is so small that coal-mining can scarcely be said to exist. The copper and iron found in the same region are unworked, the requisite supply being imported from Russia. Practically the only fuel used in the country is wood, supplemented in the mountainous regions by dung and boortza. Trees are consequently disappearing, for the planting of young trees does not by any means keep pace with the destruction of the old. The fuel supply of the towns has to be brought from ever-increasing distances, and at growing cost. Sometimes the trunks of trees are left standing after being denuded of branches, bare and almost leafless poles, but even of these not many are of any considerable size except poplars, which are generally spared from mutilation.

Trade and traffic are carried on in Sin-Chiang as they have been from time immemorial. Many towns and villages have regular markets or bazaars, during which their dilapidated appearance is brightened by the display of gaudy wares, and the usually deserted streets are thronged. The traders who frequent these bazaars carry their wares from place to place, often travelling long distances seated on the backs of ponies, with baggage suspended on either side. Their wares consist mostly of Russian cloth and chintzes, for on the export of these articles the Russian Government pays such bounties as enable Russian manufacturers to defy competition in Sin-Chiang. Goods from other countries, however, are by no means rare. At Yangi Hissar I was surprised to

see displayed amongst other things a small tin with a label which was a very close imitation of that used by Huntley and Palmer. With the help of Kasim I obtained the tin, which contained mixed sweet biscuits of good quality, made in Germany, and bore the maker's name. The price was half a sarr, or about a rupee, a moderate sum, if the distance the tin had been brought is considered.

Russian interests, commercial, no less than political, are kept under close supervision by the Russian Consul-General. At Yarkand I wished to get a few small luxuries from Russian Turkestan, and applied to the Aksakal of the Andijan traders for some assistance. That official was personally willing to help me, but nevertheless he soon made it clear that he would not allow any Russian subject to purchase anything for me without the explicit consent of the Russian Consul-General.

The trade between India and Sin-Chiang is in a languishing condition, and is to a large extent in the hands of Hindus, some of whose reputations cannot be considered good. The Pundit Boota Ram, whom I have had occasion to mention more than once, was a fair specimen of his class. I had some intention of purchasing gold from him, and he not only asked me twenty tongas per sarr more than the current price, but protested that his price was the current price. His weights, moreover, were false, being in error in his favour by one balance to the extent of one-hundredth, and by another to the extent of one-tenth. One Kashmir trader said to me of another, "Oh, Sahib, he is a good man but a Kashmiri, and has cheated the devil himself." All traders, foreign and native alike, regard a European as fair game, and demand prices from him far above those they would accept from each other. Some approximation to a reasonable bargain may be reached after long higgling, but if this process is

disagreeable the white man may effectually humble and vex the trader by accepting the first offer. He thus represents himself as a "green-horn," and the trader thinking he might have had double the amount for the asking, abases himself and bemoans his folly in having let his victim off so easily.

Indian traders labour under great difficulties. The nearest railway station is at Rawal Pindi, whence the transport to Yarkand occupies about two months. From Leh to Yarkand the cost of carriage fluctuates, but is usually about forty rupees for 240 lbs., the route being practicable for caravans during not more than about five months in the year. The merchandise these traders bring is of many kinds, all in small quantities, bought, not from British manufacturers directly, but from middlemen in Bombay, Calcutta, and Karachi, and burdened with the Indian customs duty. The profits are consequently small (about 10 per cent.), and traders usually make only one venture in two years. Formerly they imported large quantities of charas or hemp into India, but the duty on this article has recently been increased to such an extent as to be almost prohibitive. There is no commercial treaty regulating the trade between India and Sin-Chiang, and formerly the Hindu traders had many grievances, the foremost of which was the impossibility of recovering debts; but by the action of the British agent difficulties of this nature have been removed.

Hindus engage also in money-lending, a profession in which some Chinese also embark. The rate of interest varies from 75 to 150 per cent., and, though bad debts are not infrequent, large profits are speedily made. Most of the people whom I met, except officials, were heavily in debt, the most seriously encumbered being the transport contractors.

The transport animals in Sin-Chiang are mainly ponies,

donkeys, and a few mules. Camels are common about Kashgar and in the country to the west of that town, but they are employed only in winter. For two camels I paid 1,100 tongas, a high price, but the animals were young, well built, free from sores, and in excellent condition. For the hire of two camels in 1898 the charge was five tongas each per day. From my own experience, which was not extensive, I believe that these animals are not suitable for travelling in such countries as Tibet and Aksai Chin. Where the country is mountainous and the tracks dangerous, yak are often used for transport. The commonest beast of burden is the donkey, which can carry his owner, or his owner's wife and child, or a load of about 160 lbs. Good donkeys are not easily procured; an inferior one may be purchased for about forty tongas; a fairly good one for about 100; but for an exceptionally fine animal 160 would not be an exorbitant price. For the hire of donkeys the usual charge was one miskal each per day, but in Sarikol the rate was higher. When several donkeys were hired for the journey from Kashgar to Karghalik, about 156 miles, occupying seven days, the charge was twelve tongas for each animal.

The ponies used in Sin-Chiang are of two types, one large, the other small and thick-set. The large are much more common than the small, but for travelling in a mountainous country they are much less suitable. They cost more, are more troublesome to load, require more assistance on difficult tracks, and lose condition far more quickly than the smaller animals. A European, with the assistance of a native broker, may obtain a fairly good small baggage pony for about 200 tongas, but in the negotiation of the bargain much patience is required. The hire of ponies is about double that of donkeys, but as their baggage load does not exceed 240 lbs., exclusive of corn, the use of donkeys is cheaper and more convenient.

The mules in Sin-Chiang nearly all belong to Chinese and are well looked after, as are all the animals in Chinese ownership.

The natives are about as bad horse-masters as can be imagined. In the course of a march they do not allow their animals to drink lest they should turn lame from water in the feet, and when the march is ended they keep them tied up without food or water with their heads high for several hours. The longer the march the longer the animals are kept hungry and thirsty. I could get no reason for this cruel practice except that it was the ancient custom of the country. If I pointed to my ponies and explained the treatment which kept them in good condition the men admitted that my system was successful, but they would not follow my example. Not only are many ponies of the natives half starved, but they suffer from galls and sore backs to which no proper remedies are applied. Perchloride of mercury and borax are obtainable at small cost in the larger bazaars, and I showed the excellent effect of the former, but the natives would not purchase them. One transport contractor procured the drugs, but he did so only to please me, not for the sake of his ponies. The transport contractors being ignorant of the proper treatment of ponies, improvident, and often burdened with debt, occasionally make contracts which they have not the means of fulfilling. A glaring instance of this was shown by Abdul Khalik, who for a time was my caravan bashi. He contracted with certain traders to carry merchandise sufficient to load eighty ponies, from Yarkand to Leh, and he received full payment in advance. But he only possessed forty ponies, and these he so over-worked and under-fed that very few of the loads reached Leh. The traders could obtain no redress, for the contractor had nothing worth seizing.

Such postal arrangements as exist in Sin-Chiang have

been made simply and solely for official purposes, and it was plainly the official desire that the system should not be extended. The post does, in fact, carry private letters, but these must be enclosed in official envelopes, which can only be procured at the Yamens by friends of the persons there employed. Among the people I saw no sign of any demand for postal facilities. Neither to Chinese nor to natives was time of much consequence, and probably most persons preferred to use their own animals, or to hire carts, rather than to employ fresh horses at regular intervals. The official post exists only on the roads from Kashgar to Urumtsi and from Kashgar to Yarkand, Khotan, and some other towns beyond. The service is irregular and slow. Though the letters are carried on horseback the time taken, as shown in the case of my own letters sent by official courtesy, exceeds that required by a man travelling on foot. A letter sent by the Chow-Kuan of Khotan to Yarkand, a distance of some 230 miles, was ten days *en route*, though on the road there were eight post stations where men and animals were supposed to be always ready. I travelled with a caravan over the same road in the same time. The speed with which letters are to be carried is marked on the envelopes. In cases of urgency they are marked to be carried at the rate of 400 lis a day; and if they are carried at a slower rate the persons who have caused the delay are severely punished.

Telegraph messages from Pekin (pronounced Bējin, in Sin-Chiang) to Kashgar take from one to three days in transit. They can be sent either in the Chinese language or in any European language written in Roman characters. If a message in any other language, for example, that of the natives of Sin-Chiang has to be sent, it is first translated into Chinese. Owing to the impossibility of signalling the 4,000 Chinese characters, each of them is

denoted by a number, so that Chinese messages have to be "coded" at the station of despatch, and to be "decoded" at the receiving station. All the telegraph operators are familiar with English, which is used in conjunction with Chinese on the telegraph forms, but the system as regards Chinese messages is cumbrous, and there is a possibility of frequent mistakes. Moreover, as each step in the process has, of course, to be paid for, the cost of telegraphing is high, the rate having been twice raised during 1898–99. The telegraph forms at the time of my visit bore the words, "Messages received for all parts of the world," but up to March, 1899, no interchange of messages with foreign countries had been sanctioned.

All things considered, it is not wonderful that the Pekin-Kashgar line is rarely used except by the highest Chinese officials, the Russian Consulate, and the British Agency.

CHAPTER XXI

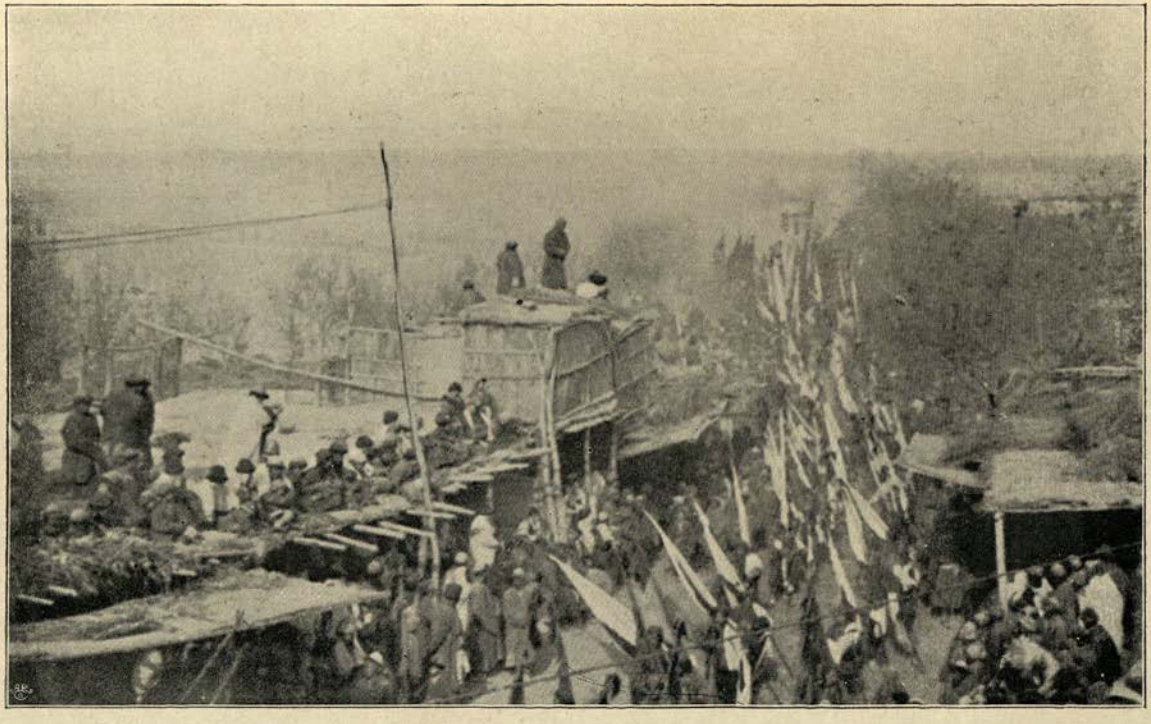
Strength of "Army"—Military administration—Artillery—Accident to "Artillery" officer—Russian designs—The Kanjut claims—Russian counter claims—Opinion of Chinese rule—Necessity for care—Possible danger from Afghanistan—Sport—*Ovis Poli*—Burrhel—Chicore—Antelope—Kyang—Yak.

THE military force of China in Sin-Chiang consists nominally of 3,000 cavalry and 4,500 infantry; but the actual strength does not exceed 960 cavalry and 1,350 infantry, the difference between the nominal and the actual numbers being due to the corruption which prevails in the military, no less than in the civil administration. At the head of the force is the Teetai, or General Officer, stationed at Kashgar, and commanding as far north as Maralbashi and as far east as Kiria. The military unit is called a *liang-tsu*, and the force contains 12 *liang-tsu* of cavalry, each nominally of 250 men, and 9 of infantry, each of 500 men. The actual number in a cavalry *liang-tsu* is about 80; in an infantry *liang-tsu*, about 150. At the head of each of these units is a *Li-Darin*, his subordinate officers being a *Li-da-li*, a *Yu-da-li*, and a *Wong*.

The nominal pay of the officers from the Teetai downwards amounts to little or nothing, and each has to make arrangements for his own livelihood. The Teetai is entrusted by the Government with an amount sufficient to

maintain the force at its nominal strength; but his first duty being, of course, to attend to his own interests, he puts half the amount into his own pocket and distributes the remainder for the support of the various *liang-tsu*. Each unit is thus reduced to half its proper strength, and a further reduction is effected by each Li-Darin who, following the example of his superior, retains for his own use a large share of the amount entrusted to him. The Taotai increases his emoluments by the sale of military appointments, each Li-Darin paying him a large sum either at once or by annual instalments. The pay of the soldiers is small. The cavalry receive each 5½ sarrs per month, the infantry 3 sarrs 6 miskals, the standard bearers 4 sarrs 4 miskals, each man receiving also about 60 pounds of flour and 150 jings of wood per month. The men are naturally always short of money and in want of opium. The Li-Darin is willing to lend money at interest and to sell opium on credit at a much higher price than that current in the bazaar. At the quarterly pay-day the debts are all cleared by the simple method of deducting the amount from the pay which is due.

The foot soldiers are armed with swords and very old muzzle-loading muskets. In each *liang-tsu* of infantry there are about fifty men provided only with flags and boards, their duty in time of war being to lead others into action, and in time of peace to escort superior officers. The cavalry soldiers have to provide their own horses, but they are supplied with forage. They are armed with swords and muzzle-loading muskets; many of them carry also long wooden lances, and not a few bear flags. The cavalry I saw were well mounted on small, strongly-built cobs, which were generally in good condition and appeared to be serviceable animals. This arm of the service would doubtless prove itself mobile in favourable circumstances, but owing to lack of transport



CHINESE SOLDIERS RETURNING FROM PARADE.

would be unable to go far from the roads and supplies. The physical condition of the men, both infantry and cavalry, is injured by the habitual use of opium.

The soldiers are supplied annually with one red and white coat decorated with Chinese characters. This one garment is given free of cost, but for other clothing, even the wretched and ridiculous shoes, a deduction is made from the pay. To check desertion, three months' pay is retained every year by the officials on the understanding that the whole amount due will be paid at Urumtsi at the end of the period of service in the province. Non-volunteers are supposed to serve about eleven years, and volunteers fifteen to twenty years in Sin-Chiang.

A few years ago some drill instructors trained by foreign officers at Tientsin were sent to the province to improve the discipline, which had (and still has) scarcely any existence. The Teetai, however, was indignant at the imputation of inefficiency, and promptly dismissed the innovating instructors, stating that the troops under his command were quite effective and not in need of their services.

Musketry practice is seldom engaged in, never without special orders from the Taotai. Ranges of about fifty yards are within the barrack grounds, the targets having a surface about equal to that presented by a man's head. Usually only a small proportion of the men hit the target; but when the proportion of hits is very small the men who miss are beaten.

Parades and inspections are not frequent. At Kashgar the Teetai is present at only three in the course of the year. Before each inspection the number is raised to that of the establishment, men paid at the rate of 4 to 8 tongas being impressed from the town or market.

Nothing worthy of the name of artillery exists in Sin-Chiang. At Kashgar there are a few old and useless

pieces, probably those brought by the Forsyth Mission as a present from the Viceroy of India. At an inspection held within the last few years, the inspecting officer wished one of the guns to be fired, but could find no one who understood how to work the pieces. At length an officer, with more gallantry than skill, loaded the gun and fired; but, when he fired, he stood close behind, aiming, so that he was knocked down by the recoil and received such injuries that he died within a few days. Since that exhibition there has been no desire to see the guns at work.

The whole force is distributed among the ten military districts into which the province is divided, about one-third of the cavalry and more than half the infantry being stationed at Yangi Shahr in the neighbourhood of Kashgar. The men, however, of which the force consists, are quite unworthy of the name of soldiers. They are ill-disciplined, ill-armed, ill-clothed, and of very inferior physique; but they have many grievances, and it is not surprising that they are discontented. This force, which cannot by any stretch of courtesy be called an army, may be sufficient to repress insurrection, the purpose for which, according to inscriptions over the doors of barracks, it exists; but for defence against invasion it is utterly useless. The province is absolutely at the mercy of Russia, and will be unfit to offer any resistance when it suits that Power to take it.

The methods by which Russia is working towards that end are, however, not military, but diplomatic. In 1897 she applied to the Chinese for permission to occupy the large grazing ground known as Muluksha, lying on the north side of the Karakoram Pass, on the trade route from Yarkand to Leh. This ground was professedly to be used as a place were Russian caravans could rest, but, as the region was out of the way of Russian trade

caravans, one must suppose that military occupation was in view. Liu Ta-jin, the energetic Chow-Kuan of Yarkand, was charged to report on the matter, and he is credited with having stated that, unless China intended to abandon Sin-Chiang, the request of Russia should be refused.

The question of the Kanjut occupation of Raskam was used by Russia as the basis of a prospective claim for compensation. The Kanjuts had become subject to the Indian Government, though the Mir of Hunza, their head, paid a small tribute to China, and since they had been compelled to forsake their predatory habits they had grown too numerous to support themselves in the Hunza valley by peaceful means. They therefore resumed the cultivation of the patches of cultivable land in Raskam, otherwise unoccupied, and regarded by them as their own. Two of their number, employed in looking after the irrigation of their fields in 1897, were arrested by the Chinese on the ground that they were emissaries of the Indian Government; the Mir of Hunza thereupon made application directly to the Chinese for permission for his people to cultivate the Raskam soil which no one else desired; but Sir Buland Ali Sha, Beg of the Tajiks in the neighbourhood, also applied for similar permission on behalf of his people, not because they wanted the land, but because they were commanded to provide a pretext for refusing the Kanjut petition. The negotiation on the part of China was carried on by the Taotai at Kashgar, a weak and cringing man, who was directly under the influence of the Russian Consul-General. M. Petrovsky asserted that the Kanjut application was instigated by the Indian Government for the purpose of obtaining possession of Raskam, and that, if it were granted, Russia would demand Tagharma to counterbalance the British gain. This place is about one march north of Tashkur-

ghan, and lies close to the junction of routes to Murghabi, Tashkurghan, Kashgar, Yangi Hissar, and Yarkand. There is said to be excellent grazing in the vicinity, and Russia was credited with the design of forming a bazaar at that place in order to attract the trade from the large towns. The bazaar, however, would certainly have given place to a fort, and the traders to Cossacks. The Taotai, in accordance with the usual Chinese method, delayed to settle the matter in either way; but in February, 1899, M. Petrovsky precipitated matters by telling Wong, the official in charge of the foreign trade at Kashgar, that Russia intended to seize Tagharma. This intimation was telegraphed to the Futai, who ordered troops to be at once despatched from Kashgar to the spot. When M. Petrovsky asked the Taotai for what purpose the troops had been sent, he was told that they had no other purpose in view than to cultivate the soil. Nothing seems to have come of these negotiations, for the rumour which I heard in the spring of 1899, that the Chinese had granted the request of the Kanjuts, was not confirmed. Sooner or later, however, the whole province of Sin-Chiang will fall under the sway of Russia. The benevolent government of the Czar will some day step in on some pretext to relieve China of an unprofitable possession, or to protect the natives from injustice and extortion, or to quell an insurrection with which the Chinese troops will be pronounced powerless to cope. Should this last pretext be adopted, the Chinese administration would have itself to thank; for insurrection is about the last course to which the natives would of their own accord resort. Any riots and disturbances which occur are got up by the officials for the purpose of inflicting injury on foreigners. The population have no fighting courage, no arms, no leaders, are totally incapable of combined action, and, so far as the government of their own country is concerned,

may be regarded as of no account. They have been squeezed to the utmost, but would prefer to remain under the dominion of China. If they are questioned, they say "The Chinese plunder us, but they do not drive and hustle us, and we can do as we please." This opinion agrees with that of the Andijanis, or natives of Russian Turkestan, who assert that Russian rule is much disliked among them, owing to the harassing administration to which they are subjected. The natives of Sin-Chiang are opposed to all change, whether for the better or the worse; but if Russia were to administer their country with honesty and justice, leaving perfect freedom in religious matters, there can be no doubt that the majority would eventually recognise great improvement in their condition. A Russian occupation of the province need not, *so far as commerce is concerned*, appreciably affect the interests of Great Britain. The trade with India is small and is decreasing; few British travellers visit the region, and if to traders and travellers fair treatment were assured, the change of government would probably be advantageous to both. No sane man acquainted with Sin-Chiang would advise the Government of India to saddle itself with its administration.

Nevertheless, it is necessary for the British-Indian Government to keep a careful watch on the movements of Russia in Central Asia, especially in Tibet. In that part of the world Russia cares less, in the first instance, for the development of her trade than the enlargement of her boundaries. Her settled purpose of territorial extension advances steadily, though without haste, and it seems to be her destiny to absorb and reorganise for her own purposes the semi-barbarous nations on her frontiers. If her designs looked no further, there would be no cause for disquietude, but every southward advance of Russia brings her nearer to India, and Russian officers and writers do

not conceal that her ultimate aim is the possession of that empire. While she is strengthening her hold over new lands and reaching forth to seize others, she is unostentatiously improving her communications and intriguing for political advantages wherever intrigue is possible. A fresh illustration of this method was provided in a telegram which appeared in the *Times* of October 15, 1900, stating that an Envoy Extraordinary of the Dalai Lama of Lhasa had been received in audience on October 13th by the Czar at St. Petersburg.

It is not to be supposed that a large body of troops from the north could ever penetrate far to the south of the Hindu Kush, but, when the Russian and Indian frontiers are identical, there will be little or nothing to prevent the despatch of small columns to the south. In connection with this question the unsatisfactory political position of Afghanistan should not be overlooked. There duplicity and treachery flourish, and Russian roubles may exert an important influence on the tide of public and private feeling. The Afghan army having been improved, armed with modern rifles, and even supplied with about 300 Maxims, and field-guns, manufactured on a large scale in the country, attention is now directed to the organising of an efficient transport service. There can be no doubt that in the recent frontier war in Tirah not only had the tribes been aided and abetted, but many of them had been armed against us by the Amir of Afghanistan. The allegiance of this potentate could scarcely be counted on if his assistance were required, and it is clearly the duty of the Indian Government to maintain its own military forces in such strength and thoroughly up-to-date efficiency that they may be ready for any emergency.

Of the different kinds of game which I met in Sin-Chiang, the *ovis Poli* is undoubtedly the most worthy of

the attention of sportsmen. It was only on the Taghdumbash Pamir that I found this animal, and there, owing to the constant shooting of it by Kirghiz and Tajiks, as well as by British sportsmen, it has become more rare than it used to be. The specimens most in request are old rams, the fine heads of which find a ready sale in Tashkurghan, Yarkand, and other places; but, unfortunately, the natives shoot any animal, male or female, that comes in their way.

My first attempt to stalk this sheep was made in the end of October, 1897, in the nullah known as Kukteruk, in the western part of the Chinese Pamir. I was accompanied by a shikari, my orderly, and the cook, and we pitched our camp, consisting of two tents, near the spot where the nullah bifurcated, some miles from its mouth. The place was partially sheltered; numerous skulls of the *ovis Poli* were lying about; yak dung for fuel was abundant; and my shikari considered this spot to be as near to the ground frequented by the sheep as it was advisable to camp. As soon as the tents were pitched all hands began to collect dung, and early in the afternoon, when we had to discontinue the work owing to falling snow, we had a good supply. Several sheep came in sight at no great distance, but all of them had small heads, and I passed the evening in my tent, sitting on the ground in front of my hot stove, reading the latest English newspapers and telegrams which Captain MacMahon, C.S.I., C.I.E., the Political Agent at Gilgit, had sent me. In the morning it was necessary to start long before daylight in order to reach by dawn the places where game was most likely to be found. We turned out about 3 o'clock, when the temperature was at 6° F. or twenty-six degrees below the freezing point; but warm clothing, a thick fur coat and cap, and long warm boots kept me comfortable. In the darkness it was impossible

to walk without continually stumbling over rocks and stones, but I got over the ground safely, seated on the back of a slow-going yak which did not stumble once. I saw many sheep, but those which were within range were females or young males, the old animals being too wary to let me approach within several hundred yards. The events which happened were similar every morning. Small-headed sheep were accessible, but the two good heads I wished to possess kept invariably beyond my reach. Their owners took up a position on high ground, whence they could see all along the valleys; and, as there was no cover of any sort, every attempt I made to stalk them failed.

Leaving this valley I rejoined Cobbold, who, I found, had met with better success than had fallen to my lot. Seeing that he had shot three sheep with heads measuring respectively 56, 59½, and 62 inches, I resolved to make another effort as soon as my work permitted. Starting in the dark and wending my way on the back of a steady-pacing yak up a valley till daylight, I came suddenly on two sheep with very fair heads, grazing in a small side valley. Dismounting, I laid aside my fur coat, exchanged my long boots for a rubber-soled, canvas pair, and made a long and careful round so that I got quite near the animals. The altitude of the region was about 15,000 feet, and I was out of breath with my exertions, when, peering over the rock, I was seen by one of the sheep. Before I had time to take off my thick woollen gloves so as to be able to handle my rifle, both the animals scampered away, and I had to return to camp empty-handed.

Another day Cobbold and I, after a short stalk in the main valley, got within 150 yards of seven males as they trotted past. We both fired and three sheep fell, purpling the snow with their blood, but unfortunately their heads

were not large, those which I brought down measuring 46 and 47 inches respectively. In skinning and cutting up the carcasses we avoided frost-bite by frequently warming our hands on the flesh.

In the following year better luck attended my efforts, and I shot another sheep, whose horns measured 59¼ inches in length, 16 inches in circumference, and 46 inches from tip to tip.

In the Taghdumbash Pamir I never saw or heard of any big game other than the *ovis Poli;* but, on the grassy slopes, between the Kukalung Pass and Zad, I saw a large herd of burrhel, one animal having a particularly fine head. I was unable to get within range as, between them and me, there was a valley with very precipitous sides, but, being tempted by the fine head belonging to an old male which stood on a commanding eminence and watched his flock mounting the steep and rocky bank, I fired several shots. The distance, however, was too great, and he scampered off, apparently with a whole skin. A few days later I had better luck, for I shot a fair-sized burrhel with horns measuring 24¾ inches along the curve, 10¼ inches circumference, and 18¾ inches between the tips.

If the Tajiks are to be believed, a few sheep (*ovis Poli*) with small heads frequent the upper part of the Uchi or Wacha valley on the west side. On both sides of the Yarkand River, between Camp 137 and the mouth of the Danga Bash or Tashkurghan River, I several times saw flocks of ibex. The specimen I shot near Tir had, like the others I saw in Sin-Chiang, a small head, but the carcass provided a large supply of meat greatly appreciated by the natives, who esteem this flesh a luxury. The pursuit of the ibex in the valley of the Yarkand River need only be undertaken by those who have both energy and patience abundantly at command, and who are at

home on the steep and lofty ridges which are the haunts of this animal. Even such sportsmen will probably meet with difficulty and danger out of all proportion to the game they will secure.

In nearly all the smaller valleys there are many chicore; possibly in Raskam there may be a few, but in the desolate valley of the Yarkand River north of that tract we saw not one. The larger variety, called ram chicore, we

SKINNING A YAK'S HEAD.

found only on ground over about 14,000 feet in altitude. This bird is exceedingly wary; his sense of hearing is very acute, and when he detects the presence of an intruder he flies away with a loud cry, in groups like small coveys of partridges, across the valleys to alight on ground where he can scarcely be discerned. We could occasionally hear the birds as they retired, but very seldom were able to shoot them. Their flesh is white,

resembling the flesh of a large capon more than that of any game bird I have ever seen in the Himalayas.

On the plains of Sin-Chiang, now and then a gazelle may be found, and in winter a few wild duck, but, on the whole, both ground and winged game are remarkably scarce.

In Western Tibet, on the other hand, it is unusual to travel for a day without seeing antelope and kyang (a sort of wild donkey). The former of these animals is a valuable friend to travellers, and is seldom found at elevations under 15,000 feet. He is in many places remarkably tame, remaining close to the caravan and watching it with evident curiosity. The flesh is almost destitute of fat, even when the animal is well nourished. The antelopes shot by Pike and me in 1896 were all in good condition, but those I found in 1899 were thin, probably because of an unusually severe winter.

In a few places on lofty ground in Tibet we found yak in herds numbering from ten to thirty, and sometimes more. Most of the animals were black, brown specimens being very rare. These roving herds move with great agility over the steep and stony ground, apparently enjoying the snow and frost and wind which seldom fail. At about the distance of two marches east of Charol Cho I observed a very large herd resting on the top of a high ridge covered with snow, where it was evident that a strong cold wind was blowing. They sought no shelter, not even that which they could easily have found on the lee side of the ridge. Yaks are capable of offering formidable resistance to the sportsman, as Pike found in an adventure which has already been recorded. One day I stalked a solitary bull yak, and, after a long round, got within range. Some bullets from my ·303 carbine brought him to the ground, and I stepped towards the animal thinking he was as good as dead. It was lucky that I

slipped a few cartridges into the carbine magazine and one into the chamber, for, when I was surveying the animal only a few yards from its head, he suddenly rose and, with an angry look and lowered head, seemed about to charge. A bullet from my carbine entered his brain and he fell for the last time. The horns were very short, measuring only 25½ inches in length, 13 inches in circumference and 17 inches from tip to tip, though the animal was the most bulky our men had seen.

In Western Tibet there are a few gazelle ; hares are not uncommon, and ducks and geese are frequent visitors at certain places.

APPENDIX I

GEOGRAPHICAL

[*Published with the kind permisson of Lieut.-Colonel St. G. C. Gore, R.E., Surveyor-General of India.*]

MEMORANDUM ON THE COMPILATION OF CAPTAIN DEASY'S MAP, 1896 (*Revised*).

Latitudes.

The Observed Latitudes have been accepted and used throughout.

Longitudes.

Camp 1. Lat. 34° 23′ 23″, long. 79° 34′ 28″. The longitude was computed in terms of Peak E. 31 (identical with G. T. Tartary No. 1 Peak, *vide* Synoptical Volume VII.), and from it the longitudes of S. P. 9 and S. P. 6 were computed by means of Captain Deasy's traverse to the Lanak La.

Camp. 3. Lat. 34° 27′ 3″, long. 79° 58′ 25″. The longitude was first computed in terms of S. P. 11, 12, and 18, which were believed to be identical with the G. T. points Mangtza Lake Nos. 3, 2, and 1, but the three resulting values were 79° 56′ 1″, 79° 57′ 27″ and 79° 58′ 47″. The longitude of S. P. 9 was now worked out through the triangle to S. P. 9, using each of these values. That deduced, using the value from S. P. 18, agreed within 6″ with the value of S. P. 9 brought up from Camp 1, through traverse and triangulation. The value of S. P. 6 similarly worked agreed fairly well. This was taken to prove the identity of S. P. 18 with G. T. Peak Mangtza Lake No. 1, and the corresponding value of Camp 3 was accepted.

All the G. T. points here referred to have been fixed by only two rays, so their G T. values cannot be considered absolutely reliable.

Camp 11. Lat. 34° 35′ 17″, long. 81° 9′ 22″. The longitude of this camp was computed through S. P. 6, which is fixed by triangles from

both Camp 3 and Camp 11. The peak is a prominent one, and Captain Deasy says there can be no doubt about its identification. The peak is, however, only fixed by a single triangle, so the value is unchecked. S. P. 14 was also tried, but proved to be doubtful, with a difference of 2′ 10″ in latitude and 1′ 33″ in longitude.

As there was no trigonometrical connection between Camp 11 and any of the subsequent camps, a fresh commencement was made at the closing end of Captain Deasy's work.

Camp 74. Lat. 34° 3′ 43″, long. 79° 43′ 1″. The longitude was computed from Peak E. 32, which is the same as G. T. Tartary No. 2 Peak.

Then from Camp 74 the value was carried through Peak 256 to Camp 67; but when the latitude of Camp 67 thus brought up was compared with its observed latitude, a difference of 1′ 38″ was found; so Peak 256 was rejected, and Camp 74 stands by itself, there being no connection with any other camp.

Camp 63. Lat. 33° 59′ 40″, long. 80° 51′ 25″. The longitude of this camp was computed by means of an azimuth taken to S. P. 6 from the camp which lay well to the south of the peak, and by the difference of latitude of the peak and the camp.

Camp 67. Lat. 33° 54′ 53″, long. 80° 33′ 16″ The longitude was computed from Camp 63 by azimuths and difference of latitudes through Peaks 220, 232, and 28, as below:—

Pk. 220 single ray from C. 67, triangle from C. 63
,, 232 ,, C. 63 ,, C. 67
,, 28 ,, C. 63 ,, C. 67

The longitudes through above peaks agreed within 30″, so their mean was accepted.

Camp 61. Lat. 33° 53′ 37″, long. 81° 11′ 23″. The longitude was computed through Peaks 212 and 193:—

Pk. 212 triangles from C. 63 and C. 61
,, 193 ,, C. 63 and single ray from C. 61

The two values differed by 5″; the mean was adopted.

Camp 57. Lat. 33° 47′ 35″, long. 81° 36′ 8″. The longitude was computed through Peaks 195 and 193:—

Pk. 193 triangles from C. 63 and C. 57
,, 195 single ray from C. 61 and triangle from C. 57

The two values differed by 2″; the mean was adopted.

Camp 51. Lat. 33° 16′ 31″, long. 82° 1′ 4″. The longitude was computed through Peaks 142, 162, 169, and 170:—

Pk. 142 single ray from C. 57 and triangle from C. 51
,, 162 triangle from C. 57 ,, C. 51
,, 169 single ray from C. 57 ,, C. 51
,, 170 ,, C. 57 ,, C. 51

The values from Peaks 169 and 170 being discordant, were rejected; the mean of the other two values, which agreed with the chronometer value, was adopted.

Camp 49. Lat. 33° 3′ 41″, long. 82° 7′ 37″. An attempt was made to deduce the longitude of this camp from Peaks 136, 142, 143, 144, 145, and 137; the results were discordant, so the difference of longitude between Camps 51 and 49 was computed by chronometers A and B. These gave $\Delta L + 5' 30''$ and $+ 6' 45''$ respectively. The mean of these gave a longitude for Camp 49 closely agreeing with the mean value derived from Peaks 142, 143, 144, and 145, which latter value was therefore adopted.

Camp. 43. Lat. 32° 32′ 32″, long. 82° 30′ 38″. The longitude was computed by direct triangles through Peaks

136	from C. 49,	resulting long.	82° 30′ 40″
137	,, C. 49	,,	82° 30′ 36″
129	,, C. 51	,,	82° 37′ 17″
131	,, C. 51	,,	82° 34′ 14″

The two latter were rejected and the mean of the first two adopted.

The triangulation could not be carried further back eastwards, so the value was carried northwards across from Camp 57 to Camp 22.

Camp 22. Lat. 34° 43′ 10″, long. 82° 15′ 25″. The longitude of Camp 22 has been deduced from C. 57 through Peak 70, which was fixed by a double triangle from C. 57 and by a single one from C. 22. The values of the common side from C. 57 differing by 1,140 feet, two deductions of latitude and longitude of C. 22 were therefore computed with the two values of the common side; and as the resulting latitude of C. 22 from one of the triangles agreed closely with the observed latitude of that camp, the corresponding longitude value was accepted and the second triangle rejected.

Camp 27. Lat. 34° 9′ 1″, long. 82° 18′ 6″. The only connection between C. 27 and C. 22 was a single ray from C. 27 to Peak 75, fixed from C. 22. The longitude deduced by chronometers A and B agreed with that through Peak 75 within 57″; the value through peak was therefore adopted.

Camp 28. Lat. 34° 2′ 34″, long. 82° 20′ 12″. The longitude was computed through Peaks 69, 87*a*, 88, fixed from C. 27.

Long. of C. 28	through Pk.	69	= 82° 19′ 58″
,, C. 28	,,	87*a*	= 82° 20′ 13″
,, C. 28	,,	88	= 82° 20′ 11″

As the observation from C. 27 to Peak 69 was marked doubtful, and as the latitude deduced through that peak differed from the observed latitude of C. 28, the first value was rejected and a mean of the two latter accepted.

Camp 29. Lat. 33° 54′ 13, long. 82° 26′ 46″. The longitude was

computed through Peak 87*a*, which was fixed from Camp 27; the computed latitude of C. 29 agreed with the observed latitude to 1″.

Camp 31. Lat. 33° 45′ 14″, long. 82° 39′ 10″. The longitude of the camp was computed through Peaks 92, 94, 95, 96, 97, and 98. Four of these gave discordant results, and the mean of the values obtained through Peaks 94 and 95 was accepted, the latitude so obtained agreeing well with the observed latitude of C. 31, the longitude by chronometers A, B and C differing by 28″ only.

Camp 32. Lat. 33° 39′ 0″, long. 82° 45′ 57″. None of the triangles connecting C. 32 with other camps having proved reliable, the difference of longitude between Camps 28 and 32 has been determined from chronometer B, a rate having been obtained by observations on 9th and 20th August at Camp 32.

The rates shown by chronometers A and C were not very satisfactory, so they were not used.

Camp 34. Lat. 33° 26′ 42″, long. 82° 52′ 19″. The longitude was determined by differences of latitude and azimuth from C. 34 to Peak 112 and Hill Station E, both fixed from C. 32, the resulting longitudes differing by 1′ 31″; their mean was taken.

An attempt was made to utilise a ray to Peak 105, but as the ray was not well placed and gave discrepant results, it was rejected.

The camps beyond C. 34 not having been connected by triangulation, a few of the principal ones between C. 34 and C. 43 already fixed along the southern line were determined by chronometer from Camp 34.

To do this the rates obtained from a comparison of the chronometer with the trigonometrical differences of longitude of Camps 3 and 11 were used.

Camps 37 and 41 were selected for determination, and Camp 43 was also determined in chronometric terms of Camp 34, in order to see how it agreed with its previously determined trigonometrical value along the southern line.

The difference found in the position of C. 43 as thus determined was distributed proportionately back along the line with the following resulting positions for the two camps:—

Camp 37. Lat. 33° 0′ 0″, long. 82° 53′ 19″

Camp 41. Lat. 32° 34′ 45″, long. 82° 45′ 49″

Camp 8. Lat. 34° 39′ 8″, long. 80° 49′ 27″. Its longitude was determined by azimuths and differences of latitude through rays from Camp 8 to Peaks 13 and 14, both fixed from C. 3; the resulting longitudes differed by 34″, and the mean was taken.

Camp 5. Lat. 34° 33′ 16″, long. 80° 16′ 0″. Its longitude was determined by azimuths and differences of latitude to Peaks 11 and 12, both fixed from Camp 3, the results differing by 3″; their mean was taken.

Camp 15. Lat. 34° 53′ 51″, long. 81° 41′ 10″. This camp is identical with Camp 109 of 1897–98–99. The latitude and longitude are taken from that camp.

Camp 19. Lat. 34° 50′ 34″, long. 82° 19′ 10″. The longitude was determined by chronometer B.

NOTE.—All longitudes in this list are in final G. T. terms, and require a correction of −2′ 30″ to bring them to Greenwich terms.

In order to expedite the mapping and save the constant corrections to the plane-table sheets through having to adjust the positions of all the camps, the above only were plotted, and the positions of the intermediate camps were taken from the plane-table sheets, after fitting the detail on to the positions of the plotted camps.

Trigonometrical peaks were worked out as far as possible from the various camps. As they were almost all fixed by single triangles, without check, they were only accepted when they agreed fairly well with their positions as shown on the plane-table sheets.

DEHRA DÚN. J. ECCLES, M.A.

COMPUTATION OF CAPTAIN DEASY'S HEIGHTS, 1896.

As the G. T. peaks on which Captain Deasy's longitudes have been based have not had their heights determined, it was necessary to obtain a fundamental height barometrically, on which to base the height computations.

Captain Deasy while at Leh read his mercurial barometer at Leh station, the height of which is known. He did not, however, compare his barometer with that used at the Meteorological Observatory there, the records of which for 10 a.m. and 4 p.m. daily are available. He states, however, that the situation of the meteorological instrument was within some 15 or 20 feet in height of Leh station, where he read his barometer. I have therefore assumed the two points to be identical. The reading of Captain Deasy's barometer in May was somewhat higher than that of the meteorological instrument, but on his return journey the readings were almost identical.

I have worked out Captain Deasy's heights differentially with Leh, using his readings and those recorded at Leh.

The Leh records are made at 10 a.m. and 4 p.m., while Captain Deasy, on account of the exigencies of marching, observed at 7 a.m. and 9 p.m.

No hourly record was kept from which the hourly variation could be ascertained, so an assumed hourly correction was at first applied. As this made the results generally more discordant, and as clearly the changing weather was the greatest element in the irregularities, I finally compared the mean of the readings at each place with the similar mean at Leh.

To determine the fundamental height the procedure has been as follows:—

(1) The heights of all base camps were computed barometrically, differentially from Leh.

(2) With the barometrical value of Camp 3 as an initial value, the heights of Camps 63, 67, 61, 57, 58, and 51 were computed through the triangulation. The heights thus determined in terms of Camp 3 were compared with the barometric heights of these camps, and the latter were found lower than the former by various amounts, the average of which was 60 feet. This amount was therefore applied as a correction to the trigonometrical heights. In other words, the fundamental height is obtained by taking the mean barometric height of seven stations, the differences of height of which had been obtained trigonometrically.

The heights were then extended as far as possible trignometrically, the co-efficient of refraction being taken as ·06.

Such camps as were not connected by triangulation have had their heights determined direct from the barometer observations.

The barometric observations when computed gave as a rule the usual discrepancies *inter se* of from 30 to 60 feet.

DEHRA DÚN, 16*th Sept.*, 1897. (Sd.) ST. G. C. GORE, LIEUT.-COLONEL, R.E., *Superintendent, Trigonometrical Survey.*

MEMORANDUM ON THE COMPILATION OF CAPTAIN DEASY'S MAP, 1897-98-99.

Latitudes.

The observed latitudes have been accepted and used throughout.

Longitudes.

Camps 4, 5 and 6. A.H.S. is a point common to Camps 4, 5 and 6. The longitude of this point has been determined from Pamir peaks Nos. 3 and 5, through the above camps. The values are 75° 35′ 7″, 75° 35′ 8″, and 75° 35′ 3″. The latitude comparison of this point is also satisfactory.

The mean of the three values, viz., 75° 35′ 6″, has been adopted as the longitude of A.H.S. With this the longitudes of Camps 4, 5 and 6 are computed. The values of latitude and longitude are:—

Camp 4. Lat. 37° 13′ 24″, long. 75° 26′ 5″
Camp 5. ,, 37 9 10 ,, 75 29 58
Camp 6. ,, 37 11 4 ,, 75 32 20

Camp 1. Lat. 37° 8′ 44″, long. 74° 45′ 53″. The longitude was computed through Peak 5, fixed in Camp 5; the latitude agreeing within 21″.

Camp 2. Lat. 37° 7′ 35″, long. 74° 56′ 43″. The longitude was computed through Peak 5, fixed in Camp 5. The latitude comparison is very satisfactory.

Camp 120. Lat. 37° 32′ 59″, long. 75° 48′ 26″. The longitude was computed through Pamir Peak No. 3. The latitude of the peak computed in terms of Camp 120, agrees exactly with its Pamir value.

Camp 13. Lat. 36° 53′ 2″, long. 76° 2′ 44″. An attempt was made to deduce the longitude of this camp from various camps chronometrically, but none of them having proved reliable, it was computed from Camp 120 by means of azimuth and difference of latitudes through Peak 44.

Camp 14. Lat. 36° 41′ 29″, long. 76° 9′ 12″. The longitude of this camp is computed through Peaks 33 and 35 of Camp 13 by difference of latitudes and azimuths. The two values agree exactly.

Camp 15. Lat. 36° 38′ 58″, long. 76° 13′ 7″. The longitude was computed through Peaks 33 and 35 of Camp 13. The two values differed by 2″, the mean was therefore adopted. The latitude agreed within 20″.

Camp 16. Lat. 36° 32′ 46″, long. 76° 28′ 6″. The longitude of this camp is computed through Peak 52 of Camp 15, the chronometer value agreeing within 1′ 7″.

Camp 19. Lat. 36° 23′ 56″, long. 76° 49′ 59″. There being no trigonometrical connection between this and any of the previous camps, the longitude is determined by chronometers A and B; the differences of longitude are 47′ 30″ and 47′ 0″. The rate shown by chronometer C was not satisfactory, so it was not used.

Camp 21. Lat. 36° 34′ 15″, long. 76° 44′ 14″. The longitude of this camp is deduced through Peaks 77 and 78, and A.H.S. of Camp 19 as below:—

Through Peak 77 from Camp 19, resulting longitude 76° 44′ 8″
,, Peak 78 ,, 19 ,, ,, 76 44 7
,, A.H.S. ,, 19 ,, ,, 76 44 27

The mean of the above values has been accepted.

Camp 24. Lat. 36° 38′ 54″, long. 76° 42′ 10″. The longitude of

this camp is computed through Peaks 77, 87 and 90, with the following values of longitude:—

Through	Peak 77	from	Camp	19,	resulting longitude	76°	42′	1″
,,	Peak 87	,,	21	,,	,,	76	42	16
,,	Peak 90	,,	21	,,	,,	76	42	14

The mean of the three values has been accepted.

Camp 23. Lat. 36° 49′ 12″, long. 76° 31′ 53″. The longitude of the camp is computed through Peaks 77, 94 and 96 and B end of Camp 24, with the following values of longitude:—

Through	Peak 77	from	Camp	24,	resulting longitude	76°	32′	11″
,,	Peak 94	,,	24	,,	,,	76	30	32
,,	Peak 96	,,	24	,,	,,	76	31	35
,,	B end	,,	24	,,	,,	76	31	53

The longitude deduced through Peak 94 has been rejected on account of the latitudes of this peak deduced in the two camps differing by 1′ 26″. The mean of the other three values has been accepted.

Camp 109. Lat. 34° 53′ 51″, long. 81° 41′ 10″. On the authority of Captain Deasy this camp has been taken as identical with Camp 15 of 1896. The longitude is computed through Peaks 36 and 56 of Camp 11 and 14^2 of Camp 3, both of 1896. The resulting longitudes are:—

From Peak	36,	81° 41′	18″
,,	56,	81 41	1
,,	14^2,	81 41	40

The latitude comparison at the three peaks is satisfactory, but the observation to Peak 14^2 has been noted as doubtful, the longitude through this peak has therefore been rejected. The mean of the other two has been accepted. The latitude, longitude and height of this camp are more reliable than those of Camp 15 of 1896. The values of Camp 109 have therefore been adopted in the latter camp.

Camp 110. Lat. 34° 57′ 51″, long. 81° 49′ 33″. The longitude of this camp is computed through the following points:—

Through	Peak 36	of	Camp	11	of 1896, resulting long.	81°	49′	32″
,,	Peak 56	,,	,,	,,	,,		49	10
,,	Peak 46	,,	,,	,,	,,		48	14
,,	Peak 14^2	,,	3	,,	,,		50	9
,,	A.H.S.	Camp	109	,,	,,		49	34
,,	C.H.S.	,,	,,	,,	,,		49	34
,,	Peak 82	,,	,,	,,	,,		49	39
,,	Peak 83	,,	,,	,,	,,		49	40
,,	Peak 84	,,	,,	,,	,,		49	27
,,	A.H.S.	Camp	110	fixed	in Camp 109		49	38
,,	B.H.S.	,,	,,	,,	,,		49	35
,,	A,	,,	,,	,,	,,		49	37

The longitude through Peak 46 is deduced from a bad conditioned triangle, and the observation to Peak 14² has been noted as doubtful; the longitudes through these two peaks have therefore been rejected, and the mean of the remaining ten has been accepted. All the latitudes excepting those of the rejected two peaks agree within 5″; and the latitudes of Peak 56, as computed in two camps, differ by 56″.

Camp 112. Lat. 35° 29′ 59″, long. 81° 52′ 24″. The longitude is computed through Peaks 82, 97 and 42 as below:—

Peak	82	from	Camp	109,	resulting	longitude	81° 52′	27″
,,	97	,,	110	,,	,,		81 52	24
,,	42	,,	110	,,	,,		81 52	21

The mean of the three values has been accepted. The latitude comparison shows a maximum difference of 18″.

Camp 100. Lat. 35° 48′ 10″, long. 82° 19′ 8″. The longitude of this camp is computed through Peak 42 of Camp 110 and Peaks 54, 55 and 64 of Camp 112. The four values agreed within 5″; the mean has been accepted. The maximum difference in latitudes is 22″.

Camp 99. Lat. 35° 58′ 51″, long. 82° 32′ 5″. The longitude of this camp is computed as follows:—

Through	Peak	41	of	Camp	100,	resulting long.	82° 32′	1″
,,	42	,,	110	,,			82 32	2
,,	66	,,	100	,,			82 32	8
,,	54	,,	112	,,			82 32	4
,,	64	,,	112	,,			82 32	9

The mean has been accepted. The latitude comparison is very satisfactory.

Camp 98. Lat. 35° 41′ 4″, long. 81° 54′ 1″. The longitude of this camp is computed with the following results:—

Through	Peak	42	of	Camp	110,	resulting long.	81° 53′	56″
,,	63	,,	100	,,			81 54	2
,,	51	,,	112	,,			81 54	30
,,	54	,,	112	,,			81 54	0
,,	55	,,	112	,,			81 54	4

The longitude through Peak 51, being discordant, is rejected. The mean of the other four values has been accepted.

Camp 93. Lat. 35° 40′ 2″, long. 82° 10′ 28″. The longitude of this camp is computed through Peaks 42 of Camp 110, 63 of Camp 100, and 55 and 64 of Camp 112. The maximum difference in longitude between the four values is 45″. The mean has been accepted. The latitude comparison is satisfactory.

Camp 97. Lat. 35° 41′ 10″, long. 81° 48′ 57″. The longitude of this camp is determined as below :—

Through	A.H.S.	of	Camp	97	fixed in	Camp	98,	resulting long.	81° 48′ 56″
,,	D.H.S.	,,	,,	97	,,	,,	,,		81 48 55
,,	A.H.S.	,,	,,	98	,,	,,	,,		81 48 55
,,	Peak 25	,,	,,	98	,,	,,	,,		81 48 55
,,	,, 26	,,	,,	98	,,	,,	,,		81 48 55
,,	,, 27	,,	,,	98	,,	,,	,,		81 48 56
,,	,, 41	,,	,,	100	,,	,,	,,		81 49 1
,,	,, 42	,,	,,	110	,,	,,	,,		81 48 18
,,	,, 66	,,	,,	100	,,	,,	,,		81 49 1
,,	,, 107	,,	,,	112	,,	,,	,,		81 49 1

The longitude throughout Peak 42, being discordant, is rejected. The mean of the rest is accepted.

Camp 116. Lat. 35° 52′ 46″, long. 81° 30′ 23″. The longitude of this camp was computed through Peaks 28, 37 and 113 of Camp 97, and Peak 58 of Camp 98. The value deduced through Peak 28, being discordant, is rejected. The maximum difference between the other values is 25″; their mean has been accepted. The latitude comparison is satisfactory.

Camp 73. Lat. 36° 14′ 18″, long. 81° 30′ 59″. The longitude of this camp is computed through Peaks 41 and 66 of Camp 100. and Peaks 119, 28 and 115 of Camp 116. The latitudes of Peak 119, as deduced in two camps, differ by 2′ 29″; the longitude through this Peak is therefore rejected. The mean of the remaining four has been accepted. The probable error in longitude, neglecting the probable error of the initial longitude, is 1″.

Camp 67. Lat. 36° 30′ 42″, long. 80° 47′ 32″. The longitude of this camp is computed through Tekilagh Tagh (A) (identical with Kuin Lún No. 2, of Synoptical volume vii. of the G.T. Survey of India) and Peak 37 of Camp 97, and by azimuth and difference of latitudes through Peak 12 of Camp 73. The last determination, being discordant, is rejected. The latitudes of Tekilagh Tagh (A), as deduced in this camp and in the Synoptical volume vii., differ by 28″, and the latitude of Peak 37, as deduced in Camps 97 and 67, differ by 30″. The remaining two values of the longitude agree within 29″; their mean has been accepted.

Camp 84. Lat. 36° 47′ 8″, long. 83° 50′ 22″. As there is no trigonometrical connection of this camp with any of the previous camps, an attempt was made to determine the longitude by chronometer comparison from Camps 73 and 96. The values by A and C chronometers in Camp 73 are 83° 57′ 44″ and 83° 42′ 59″. As there was no comparison of C at Camp 96, the value deduced by the only

chronometer A from that camp is 83° 46′ 58″. Although there is a difference of 15′ in the two values from Camp 73, their mean, 83° 50′ 22″, closely agrees with that adopted by Captain Deasy in his computations. This mean has therefore been accepted.

Camp 162. Lat. 39° 28′ 19″, long. 76° 1′ 2″. An attempt was made to deduce the longitude of this camp by chronometer comparison from Camps 35 and 37. Chronometers A and C were used, and the values were all discordant; but that by chronometer A of Camp 35 seemed more reliable, as it is not far from the longitude shown on the plane table and Captain Trotter's value of Yangi Shakr (Kashgar). This value has therefore been accepted.

NOTE.—All longitudes in this list are in final G. T. terms, and require a correction of —2′ 30″ to bring them to Greenwich terms.

COMPUTATION OF CAPTAIN DEASY'S HEIGHTS, 1897–98–99.

The heights in the Western portion of Captain Deasy's work of 1897–98–99 are based on the heights of 3 P.C. and 5 P.C. of Pamir Triangulation. Those in the Eastern portion are based on the heights of Peaks 36 and 56 of Camp 11 of his work of 1896, which again were based on the fundamental height of Camp 3 of 1896, obtained from a series of observations with a mercurial barometer at various camps, the relative heights of which had been determined by triangulation. The heights of 1896 were computed differentially from Leh, by means of simultaneous observations recorded there. The heights of astronomical camps of 1897–98–99 which were not connected by triangulation were fitted in between two triangulation camps; that is to say, one triangulation camp was computed in terms of another through a chain of astronomical camps, the relative height of each camp being deduced barometrically, differentially from one immediately preceding it. The difference between the value thus obtained and the fixed value of height was distributed amongst the intermediate astronomical camps. In computing the relative heights the co-efficient of refraction was taken as 0·06.

Dated, DEHRA DÚN, *July*, 1900.

J. ECCLES, M.A.,
Superintendent Survey of India.
In charge Computing Party.

LATITUDES, LONGITUDES, AND HEIGHTS OF PEAKS FIXED FROM CAPTAIN DEASY'S CAMPS IN 1896.

Name of Station.	Latitude N.	Longitude E.	Height above Sea Level.
	° ′ ″	° ′ ″	Feet.
Camp 1.			
Peak E. 31 (G.T.)	34 18 31	79 36 28	20950
Lanak La	23 50	79 36 50	18000
Camp 3.			
Peak 6	34 30 31	80 24 55	20540
,, 9	23 40	79 52 9	20250
,, 11	47 10	80 21 32	21350
,, 12	45 7	23 19	20960
,, 13	47 0	40 57	20470
,, 14[2]	53 42	81 0 1	20270
,, 15	44 6	80 40 6	19380
,, 18 (G.T.)	26 53	17 21	20150
,, 19	24 22	20 59	19990
,, 20	22 36	17 45	20500
,, 22	21 25	2 57	20610
,, 25	22 20	79 55 17	...
Camp 11.			
Peak 33	34 31 19	81 11 21	19010
,, 36	34 43	28 8	20180
,, 39	46 57	11 50	18560
,, 41	30 27	80 48 48	20620
,, 45	23 51	54 17	21120
,, 46	20 9	55 58	21140
,, 47	20 7	81 0 31	20580
,, 53	35 2 2	29 16	...
,, 55	34 44 32	41 14	...
,, 56	35 19 27	80 58 22	23490
Camp 22.			
Peak 78	34 27 50	82 31 48	18850
,, 79	9 20	13 12	20980
,, 80	17 39	82 1 24	21090
,, 81	22 54	81 41 18	20470
Camp 27.			
Peak 87*a*	33 51 54	82 38 25	19360

Name of Station.	Latitude N.	Longitude E.	Height above Sea Level.
	° ′ ″	° ′ ″	Feet.
CAMP 28.			
Peak 92	34 5 1	82 15 28	...
,, 93	33 56 5	40 58	18930
CAMP 29.			
Peak 94	33 58 45	82 19 33	20100
,, 95	48 59	40 2	...
CAMP 32.			
Peak 89	33 40 53	82 32 48	20690
,, 104	33 41	41 10	19010
,, 105	39 55	83 15 53	19840
,, 106	13 58	20 41	19180?
,, 107	46 27	3 1	18300
,, 108	15 33	31 36	20120
,, 109	11 2	27 12	20910
,, 110	16 24	82 7 45	20480
,, 116	27 54	17 57	20970
,, 117	36 22	22 48	19910
CAMP 34.			
Peak 120	33 25 35	82 53 18	17270
,, 122	32 48 0	82 0 52	...
,, 123	33 19 45	82 36 25	16900
CAMP 43.			
Peak 132	32 34 12	82 5 17	18120
,, 133	44 1	81 42 47	19140
,, 134	42 17	57 4	16750
,, 135	54 10	38 10	18960
CAMP 49.			
Peak 136	32 43 6	82 14 16	17840
,, 137	40 55	21 8	17500
,, 140	45 21	10 22	18430
,, 141	33 7 38	81 55 29	16870
,, 144	35 49	58 8	20550
CAMP 51.			
Peak 142	33 26 56	81 44 58	21020
,, 159	25 45	52 34	19830
,, 163	46 38	82 23 38	20820
,, 166	22 45	11 37	19850
,, 168	38 52	81 50 17	19780
,, 170	32 47 58	11 25	20980

Name of Station.	Latitude N.			Longitude E.			Height above Sea Level.
	°	′	″	°	′	″	Feet.
CAMP 57.							
Peak 70	34	19	0	81	48	18	20560
,, 184	33	48	42		44	47	19500
,, 185		40	37		20	29	20100
,, 187		43	53		15	27	19780
,, 188		44	19		13	36	19880
,, 195	34	8	23		9	40	20110
,, 198		24	42		33	19	20060
,, 201	33	43	4		37	21	19600
,, 205		59	10		38	22	...
CAMP 61.							
Peak 213	33	55	42	80	44	24	18370
CAMP 63.							
Peak 212	33	48	13	81	3	58	19120
,, 220	34	19	43	80	38	3	21000
,, 221		13	29		36	2	18290
CAMP 67.							
Peak 28	34	30	27	80	48	43	...
,, 235		20	53		17	48	20610
,, 237	33	35	54		54	3	19360
,, 240	34	4	1		19	51	20060
,, 241		4	56		22	25	19830
,, 242		7	31		24	43	19340
,, 244		9	46		20	11	19080
,, 245		13	59		57	39	20890
,, 246	33	25	42		36	44	...
,, 247		35	39		29	4	19230
,, 249		18	59		11	1	...
,, 250		39	59		23	27	18800
,, 251		37	56		8	1	19530
,, 256	34	5	49	79	54	17	22120
CAMP 74.							
Peak E. 32 (G.T.)	34	16	9	79	40	52	21560
,, 269		14	40		38	2	21270

NOTE.—All Longitudes are in final G. T. terms and require a correction of −2′ 30″ to bring them to the Greenwich terms.

DEHRA DÚN, 17*th September*, 1897. } ST. G. C. GORE, LIEUT.-COLONEL, R.E., *Superintendent, Trignometrical Surveys.*

Compared by K. K. DUS and RAM SINGH (*from the printed pamphlet*).

LATITUDES, LONGITUDES, AND MAGNETIC DECLINATION AT CAPTAIN DEASY'S CAMPS.

Date.	Place.	Latitude N.			Longitude E.			Magnetic Declination E.	
1896		°	′	″	°	′	″	°	′
16 June	Camp 1	34	23	23	79	34	28	3	50
19 ,,	,, 3		27	3	79	58	25	3	47
21 ,,	,, 4		31	40	80	8	0	3	55
22 ,,	,, 5		33	16	80	16	0	3	52
25 ,,	,, 7		34	15	80	37	30	3	50
26 ,,	,, 8		39	8	80	49	27	3	48
27 ,,	,, 9		38	51	80	58	15	3	48
28 ,,	,, 10		46	1	81	15	20	3	23
5 July	,, 12		41	40	81	24	05	3	50
6 ,,	,, 13		48	25	81	36	10	3	40
10 ,,	,, 15		53	51	81	41	10	3	52
18 ,,	,, 16		54	57	81	55	10	3	47
19 ,,	,, 17		55	38	82	15	20	3	49
20 ,,	,, 18		52	36	82	23	35	3	47
21 ,,	,, 19		50	34	82	1	10	3	45
25 ,,	,, 22		43	10	82	15	25	3	45
27 ,,	,, 23	34	38	7	82	5	50	3	41
31 ,,	,, 26		19	18	82	10	0	3	33
2 Aug.	,, 27		9	1	82	1	6	3	38
3 ,,	,, 28		2	34	82	20	12	3	32
4 ,,	,, 29	33	54	13	82	26	46	3	37
5 ,,	,, 30		48	10	82	29	50	3	29
7 ,,	,, 31		45	14	82	39	10	3	24
20 ,,	,, 32		39	0	82	45	57	3	32
21 ,,	,, 33		33	41	82	46	25	3	22
23 ,,	,, 34		26	42	82	52	19	3	29
25 ,,	,, 35		17	27	82	45	20	3	18
28 ,,	,, 36		8	46	82	49	58	3	22
30 ,,	,, 37	33	0	0	82	53	19	3	29
31 ,,	,, 38	32	54	8	82	46	0	3	24
1 Sept.	,, 39		46	58	82	42	0	3	18
3 ,,	,, 40		41	17	82	45	20	3	13
4 ,,	,, 41		34	45	82	45	49	3	14
6 ,,	,, 42		32	35	82	32	10	2	58
9 ,,	,, 43		32	32	82	30	38	3	4
10 ,,	,, 45		32	56	82	9	58	3	7
11 ,,	,, 45		36	11	82	9	58	3	10
15 ,,	,, 46		45	24	81	59	30	3	11
17 ,,	,, 48		56	13	81	59	35	3	5
18 ,,	,, 49	33	3	41	82	7	37	3	25
19 ,,	,, 50		9	45	81	55	40	3	19
21 ,,	,, 51		16	31	82	1	4	3	23
23 ,,	,, 52		22	15	81	54	5	3	20
24 ,,	,, 53		29	14	81	52	45	3	35

Date.	Place.	Latitude N.			Longitude E.			Magnetic Declination E.	
1896		°	′	″	°	′	″	°	′
25 Sept.	Camp 54		34	24	81	51	20	3	29
26 ,,	,, 55		40	53	81	51	20	3	24
27 ,,	,, 56	33	44	36	81	43	38	3	23
28 ,,	,, 57		47	35	81	36	8	3	27
1 Oct.	,, 58		48	47	81	33	15	3	26
2 ,,	,, 59		55	26	81	22	5	3	32
5 ,,	,, 61		53	37	81	11	23	3	32
6 ,,	,, 62		53	6	80	57	10	3	31
9 ,,	,, 63		59	40	80	51	25	3	31
10 ,,	,, 64		55	8	80	45	0	3	30
11 ,,	,, 65		48	8	80	42	30	3	28
12 ,,	,, 66		49	34	80	35	0	3	35
13 ,,	,, 67		54	53	80	33	16	3	30
17 ,,	,, 68		58	49	80	23	45	3	28
18 ,,	,, 69	34	0	1	80	17	0	3	26
19 ,,	,, 70		2	24	80	6	0	3	34
20 ,,	,, 71		3	31	80	0	0	3	31
21 ,,	,, 72		2	44	79	53	30	3	35
22 ,,	,, 73		2	46	79	48	0	3	31
23 ,,	,, 74		3	43	79	43	1	3	27
	SECOND EXPEDITION.								
1897									
20 Oct.	,, 1	37	8	44	74	45	53	4	30
31 ,,	,, 2		7	35		56	43	4	53
2 Nov.	,, 4	37	13	24	75	26	5	4	45
4 ,,	,, 5		9	10		29	58	4	38
5 ,,	,, 6		11	4		32	20	4	39
10 ,,	,, 7	36	56	1	75	44	0	4	35
19 ,,	,, 9	37	2	43	76	6	30	4	49
23 ,,	,, 13		53	2	76	2	44	4	26
29 ,,	,, 14		41	29		9	12	4	24
30 ,,	,, 15		38	58		13	7	4	39
1 Dec.	,, 16		32	46		28	6	4	33
4 ,,	,, 18		24	20	76	41	40	4	16
5 ,,	,, 19		23	56	76	49	59	4	23
14 ,,	,, 21	36	34	15	76	44	14	4	34
16 ,,	,, 23		49	12		31	53	4	41
22 ,,	,, 24		38	54		42	10	4	32
1898									
3 Jan.	,, 27	36	58	43		17	38	4	52
17 ,,	,, 34		43	51		58	30	4	54
11 Feb.	,, 40	37	52	10		47	40	5	3
12 ,,	,, 41		44	23		37	30	4	53
14 ,,	,, 43		40	54		18	0	4	59
23 ,,	,, 46		59	9		39	0	5	0
18 April	,, 53		40	55	78	0	3	4	51

Date.	Place.	Latitude N.			Longitude E.			Magnetic Declination E.	
1898		°	′	″	°	′	″	°	′
29 April	Camp 54		37	26	78	21	40	4	35
24 ,,	,, 55		44	22		34	40	4	39
26 ,,	,, 57		59	38		36	18	4	40
30 ,,	,, 58		27	23		35	47	4	40
1 May	,, 59		22	6		48	47	4	39
2 ,,	,, 60		17	58	79	11	17	4	49
4 ,,	,, 62		12	30	79	38	54	4	24
5 ,,	,, 63		7	21		58	17	4	26
24 ,,	,, 67		30	42	80	47	32	4	9
26 ,,	,, 68		22	8	80	36	2	4	29
31 ,,	,, 70	36	18	15	81	4	0	3	56
4 June	,, 72		11	47	81	32	42	3	54
5 ,,	,, 73		14	18		30	59	4	5
18 ,,	,, 75		43	53	81	34	7	4	1
21 ,,	,, 76		51	29		43	45	4	6
4 July	,, 82		43	55	83	22	22	4	12
5 ,,	,, 83		45	30	83	34	29	4	16
6 ,,	,, 84		47	8	83	50	22	4	5
17 ,,	,, 91	35	59	35	82	26	55	3	58
25 ,,	,, 94		39	46	82	0	6	4	2
10 Aug.	,, 93		40	2		10	28	3	46
27 July	,, 96	35	40	26	81	48	43	3	53
5 Aug.	,, 97		41	10		48	57	3	54
8 ,,	,, 98		41	4		54	1	3	52
13 ,,	,, 99		58	51	82	32	5	3	48
16 ,,	,, 100		48	10		19	8	3	30
24 ,,	,, 103		33	3		33	30	3	44
25 ,,	,, 104		31	14	81	56	7	4	0
27 ,,	,, 106	35	19	56	81	43	1	3	49
28 ,,	,, 107		7	39		35	14	3	47
29 ,,	,, 108		1	19		31	37	3	55
30 ,,	,, 109	34	53	51	81	41	10	3	40
3 Sept.	,, 110		57	51		49	33	3	55
10 ,,	,, 112	35	29	53	81	52	24	3	47
20 ,,	,, 115	35	42	6	81	33	50	3	40
21 ,,	,, 116		52	46	81	30	23	3	51
12 Nov.	,, 120		32	59	75	48	26	5	1
13 ,,	,, 121		37	0		39	49	4	41
29 ,,	,, 123		23	8		41	56	5	0
9 Dec.	,, 131		16	4	76	20	00	4	44
13 ,,	,, 134		4	8	76	12	16	4	40
16 ,,	,, 137	37	2	0	75	58	46	4	17
1899									
31 Jan.	,, 153	38	6	35	77	7	30	4	53
1 Feb.	,, 154		14	34	77	19	50	4	52
11 ,,	,, 156	38	41	49	77	25	18	5	5

LATITUDES, LONGITUDES, AND HEIGHTS OF PEAKS FIXED FROM CAPTAIN DEASY'S CAMPS IN 1897–98–99.

Hill Stations and Peaks.	Latitude N.	Longitude E.	Height.
	° ′ ″	° ′ ″	Feet.
CAMP 1.—TAGHDŪMBASH PAMIR.			
B	37 8 33	74 45 16	...
H.S. A	37 12 23	74 46 0	18520
H.S. B	37 7 49	74 47 29	16820
H.S. C	37 12 6	74 46 17	18020
Peak 1	37 12 50	74 46 16	...
,, 2	37 2 17	74 50 4	19280
,, 4	37 11 51	75 1 1	18690
,, 5	37 7 57	75 17 26	19020
,, 6	36 57 31	74 56 25	20740
CAMP 4.—UJADBAI.			
B	37 14 21	75 25 33	...
H.S. A	37 11 32	75 35 6	17650
Peak 8	37 27 17	75 32 56	18550
,, 9	37 21 57	75 33 59	18170
,, 10	37 17 3	75 36 25	17500
,, 11	37 13 21	75 41 40	18000
,, 12	37 1 18	75 41 0	17790
,, 18	37 8 25	75 23 51	17220
,, 19	37 11 46	75 23 59	13640
,, 20	37 13 9	75 22 32	16540
CAMP 5.—MAZAR SULTAN.			
B	37 8 7	75 30 31	...
H.S. A	Common	to Camps	4 & 6
Plain Station C	37 8 21	75 28 20	12530
Peak 13	36 54 53	75 43 35	18810
,, 14	36 55 50	75 40 23	17840
,, 15	36 51 35	75 39 46	18460
,, 16	36 47 1	75 39 16	18900
,, 27	37 16 0	75 37 4	...
,, 28	37 0 36	75 42 52	...
,, 29	38 17 50	75 15 22	19840
,, 30	38 5 21	75 19 51	17480
Tagharmansu dble. Peak (Different from Pamir Commission Peak of this name.)	38 11 53	75 13 56	...
CAMP 6.—NEAR MAZAR SULTAN.			
B	37 11 47	75 32 37	...

Hill Stations and Peaks.	Latitude N.	Longitude E.	Height.
	° ′ ″	° ′ ″	Feet.
H.S. A.	Common	to Camps	4 & 5
Peak 24	37 3 36	75 23 6	...
,, 25	36 54 50	75 24 16	...
Camp 13.—Sarok Kamish.			
B	...	...	...
H.S. A.	36 58 15	76 0 11	13440
H.S. B	36 55 22	76 3 45	14260
H.S. C.	36 55 7	76 2 7	11680
Peak 33	36 32 14	76 16 51	19880
,, 35	36 31 44	76 16 3	20870
,, 37	36 23 47	76 14 30	20650
,, 38	36 38 16	76 8 3	16620
,, 43	37 2 21	75 56 30	16590
,, 44	37 9 36	75 55 52	18560
Camp 15.—Chiung Jangal.			
B	...	...	9930
Peak 51	36 35 51	76 24 35	15810
,, 52	36 36 24	76 19 10	13670
,, 53	36 44 41	76 2 4	17850
Camp 16.—Azgar.			
B	...	...	...
H.S. A.	36 31 32	76 27 38	12110
Peak 54	36 31 25	76 29 58	14790
,, 55	36 28 35	76 28 59	15160
,, 56	36 29 57	76 27 28	15210
,, 57	36 29 39	76 21 42	20120
,, 58	36 20 49	76 32 48	...
Camp 19.—Bazar Dara.			
B	...	...	...
H.S. A.	36 26 1	76 49 53	16880
H.S. B	36 24 30	76 47 53	15500
Peak 59	36 27 11	76 51 30	20170
,, 62	36 21 32	76 49 57	17080
,, 63	36 22 37	76 45 47	17750
,, 64	36 22 47	76 44 43	...
,, 65	36 21 39	76 40 55	...
,, 66	36 21 34	76 38 43	...
,, 70	36 26 19	76 41 39	...
,, 74	36 31 17	76 40 27	20230
,, 77	36 36 29	76 46 16	20180
,, 78	36 31 27	76 48 51	19240
,, 83	36 26 49	76 51 55	20160

Hill Stations and Peaks.	Latitude N.	Longitude E.	Height.
	° ′ ″	° ′ ″	Feet.
Camp 21.—Tapin Chat.			
B	...	...	15710
H.S. A	36 34 23	76 44 26	15150
H.S. B	36 32 51	76 44 13	16390
H.S. C	...	...	16030
Peak 85	36 33 36	76 42 37	...
,, 86	36 37 35	76 41 34	18600
,, 87	36 37 47	76 44 28	18640
,, 88	36 31 19	76 43 42	19440
,, 89	36 31 50	76 42 44	19350
,, 90	36 35 32	76 44 43	18070
,, 91	36 27 18	76 51 40	20260
Camp 23.—Zad.			
B	...	...	13760
H.S. A	36 47 4	76 28 50	17110
H.S. B	36 49 20	76 30 50	14250
H.S. C	36 48 41	76 30 50	14100
H.S. D	36 48 10	76 31 22	14310
H.S. E	36 47 31	76 31 4	15320
Peak 97	36 38 21	76 59 14	23060
,, 98	36 58 15	76 25 14	18320
,, 99	37 9 12	76 15 48	...
,, 100	37 8 13	76 15 38	17580
,, 101	37 4 8	76 15 21	17670
,, 102	37 2 18	76 11 7	18070
,, 103	36 59 1	76 11 37	18790
,, 104	37 5 0	76 16 48	17340
Camp 24.—Kukalung Pass.			
B	36 39 39	76 43 5	17690
H.S. A	...	...	16460
Peak 92	36 40 18	76 41 29	16570
,, 93	36 39 38	76 43 43	18820
,, 94	36 57 35	76 25 59	20750
,, 95	36 51 17	76 33 52	18820
,, 96	36 47 52	76 39 50	18430
Camp 67.—Chaka.			
B	...	...	...
H.S. A	36 31 19	80 48 52	6800
H.S. B	36 28 47	80 49 19	6510
H.S. C	36 31 30	80 45 11	7000
Takilagh Tagh (A), or Kiun Lun No. 2, G.T. Peak.	36 29 34	80 25 26	...

Hill Stations and Peaks.	Latitude N.	Longitude E.	Height.
	° ′ ″	° ′ ″	Feet.
Takilagh Tagh (B)	36 30 33	80 24 58	...
Takilagh Tagh (C)	36 31 2	80 24 19	...
Peak 120.....	36 32 46	80 31 2	...
,, 121.....	36 33 31	80 33 5	...
,, 122.....	36 4 42	80 10 24	...
,, 123.....	36 3 22	80 10 46	...
,, 124.....	36 2 44	80 18 50	...
,, 143.....	35 58 48	81 0 23	...
CAMP 73.—NEAR POLU.			
B.....	36 13 55	81 30 15	10520
H.S. A.....	36 15 30	81 29 41	10270
Peak 1	36 9 37	81 46 0	15800
,, 2	36 7 57	81 45 2	16650
,, 3	36 6 10	81 41 18	18400
,, 4	36 1 49	81 38 5	...
,, 5	36 1 44	81 37 3	20080
,, 8	36 1 37	81 31 0	15930
,, 9	35 58 50	81 28 5	...
,, 10	35 58 32	81 26 57	20340
,, 11	36 3 39	81 25 31	18810
,, 12	35 57 41	81 10 54	21360
,, 13	35 58 37	81 9 17	...
CAMP 84.—KARA SAI.			
B.....	36 47 51	83 51 9	...
H.S. A.....	...	...	10860
H.S. B	36 46 33	83 50 44	...
Peak 16	36 50 12	83 55 28	...
,, 17	36 50 34	84 3 39	14750
,, 18	36 45 40	84 10 48	17450
,, 19	36 45 5	84 9 48	16300
,, 20	36 43 9	84 0 39	14150
,, 21	36 43 24	83 55 28	13700
,, 23	36 42 25	83 51 19	12900
,, 24	36 42 41	83 52 16	13050
CAMP 93.—YEPAL UNGUR.			
B.....	35 39 37	82 10 37	14950
CAMP 97.—AKSU.			
B.....	35 41 41	81 48 47	...
H.S. A	35 41 54	81 46 32	16980
H.S. B	35 40 15	81 46 39	17140
H.S. C	35 39 17	81 46 25	16390

Hill Stations and Peaks.	Latitude N.			Longitude E.			Height.
	°	′	″	°	′	″	Feet.
H.S. D	35	42	15	81	46	26	16890
Peak 29	35	58	7	81	21	22	20420
,, 30	35	50	31	81	33	51	18530
,, 31	35	34	17	81	48	44	19790
,, 32	35	52	41	82	0	46	20170
,, 33	35	44	17	81	13	18	20470
,, 34	35	31	21	81	5	44	21850
,, 35	35	30	57	81	11	15	21270
,, 37	35	55	38	80	54	51	...
,, 40	35	36	21	81	45	0	...
,, 43	35	31	55	81	38	15	20280
,, 44	35	31	51	81	37	48	20040
,, 46	35	29	33	81	23	30	20250
,, 47	35	39	54	81	51	12	...
,, 48	35	53	1	82	1	48	19140
,, 50	35	26	51	81	25	21	21040
CAMP 98.							
B.		...			...		...
H.S. A	35	41	2	81	53	8	17660
H.S. B	35	40	21	81	52	51	18250
H.S. C	35	39	45	81	54	23	18150
H.S. D	35	41	17	81	54	51	17890
H.S. E	35	38	55	81	54	18	18160
Peak 25	35	44	10	81	53	58	18690
,, 26	35	52	20	81	50	50	19690
,, 27	35	51	3	81	44	1	19880
,, 52	35	37	30	82	24	16	21660
,, 53	35	41	14	81	55	13	20600
,, 56	35	26	6	82	19	9	21220
,, 57	35	59	49	81	39	22	21320
,, 58	35	59	42	81	39	2	21820
,, 59	35	59	19	81	39	7	21820
,, 60	35	59	43	81	42	10	21020
,, 110	35	34	39	82	16	14	21310
Sp. E. of 42 (1)	35	39	24	82	25	23	22810
(2)	35	39	29	82	21	25	22040
CAMP 99.							
B		...			...		...
H.S. A	36	0	3	82	31	55	16100
H.S. B	35	58	38	82	31	38	15930
H.S. C	35	59	22	82	34	3	16140
Peak 67	35	39	23	82	26	25	22160
,, 68	35	43	17	82	29	34	20860
,, 69	36	11	45	82	20	9	20400
,, 70	36	11	31	82	25	41	20310

Hill Stations and Peaks.	Latitude N.	Longitude E.	Height.
	° ′ ″	° ′ ″	Feet.
Peak 71	36 11 48	82 26 49	20330
,, 72	36 13 28	82 36 26	20490
,, 73	36 13 34	82 40 13	20380
,, 74	36 14 4	82 42 20	20760
,, 75	36 13 48	82 43 11	20380
,, 76	35 35 49	82 39 16	20060
CAMP 100.			
B	...	...	...
H.S. A	...	...	16380
H.S. B	35 50 25	82 17 9	17780
Peak 41	36 12 52	82 5 25	21660
,, 63	35 39 18	82 22 1	22690
,, 66	36 12 59	82 5 44	21850
,, 78	35 27 54	82 4 23	20030
,, 79	35 23 1	81 57 28	21200
CAMP 109.—CAMP 15 OF 1896.			
B	...	...	16450
H.S. A	34 54 33	81 42 1	16660
H.S. C	34 52 54	81 40 59	17250
H.S. D	34 52 49	81 42 8	17000
Peak 82	35 22 2	81 35 59	22150
,, 83	35 15 16	81 51 4	20850
,, 84	34 32 49	81 35 36	20370
,, 85	34 52 28	81 50 26	17640
,, 86	34 52 22	81 50 12	17610
,, 87	34 59 25	81 52 30	18480
Mark at edge of Yeshil-Kul	34 55 17	81 40 35	16090
Sp. B (1)	34 53 11	80 59 18	...
CAMP 110.			
B	...	...	...
H.S. A	34 58 52	81 51 28	18120
H.S. B	34 52 27	81 50 23	17660
H.S. C	34 59 22	81 48 35	18300
Peak 42	35 38 59	82 22 10	22760
,, 88	35 34 7	82 23 43	22350
,, 89	35 12 59	82 20 30	20030
,, 90	35 12 51	82 21 48	20100
,, 92	34 46 33	82 25 9	20640
,, 93	34 44 20	82 23 16	20750
,, 94	34 43 53	82 23 31	20490
,, 96	35 14 54	81 45 39	20010
,, 97	35 22 31	81 36 10	22070
,, 98	35 29 43	81 37 16	21910

Hill Stations and Peaks.	Latitude N.	Longitude E.	Height.
	° ′ ″	° ′ ″	Feet.
Peak 99	34 56 0	82 37 41	17530
,, 100	34 51 40	82 45 45	18760
,, 103	34 40 19	82 21 46	20260
,, 104	35 38 55	82 23 42	22700
CAMP 112.—NEAR BABA HATUN			
B	...	...	16350
H.S. A	35 30 24	81 52 18	16930
H.S. B	35 29 3	81 56 52	17860
H.S. C	35 28 24	81 53 50	17570
Peak 54	35 35 37	82 16 34	22190
,, 55	35 33 11	82 13 18	20850
,, 64	35 38 56	82 20 45	22070
,, 105	35 28 40	81 43 43	20950
,, 106	35 30 48	81 45 59	20850
,, 107	35 34 12	81 48 51	19830
,, 111	35 27 39	82 4 20	20050
,, 112	35 23 28	82 4 59	20110
CAMP 116.—AT TO PASS.			
H.S. A	35 52 23	81 31 7	17580
H.S. B	35 52 44	81 29 51	17420
Plain Station C	35 50 1	81 28 58	16310
Peak 114	35 58 50	81 28 32	19320
,, 116	36 0 8	81 39 4	21840
,, 118	36 1 38	81 36 58	20280
,, 119	35 59 2	81 30 59	18290
CAMP 120.—GOMBAZ.			
B	...	...	...
H.S. A	37 32 49	75 51 10	15140
H.S. B	37 31 11	75 44 45	13220
H.S. C	37 36 20	75 46 23	13940
Peak 125	37 43 25	75 41 53	16920
,, 127	38 12 22	75 9 19	22240
,, 128	37 41 48	75 12 1	...
,, 129	37 38 46	75 12 15	...
,, 130	37 29 38	75 33 49	18130
,, 131	37 28 20	75 33 50	18240
,, 141	37 30 38	75 54 22	18190
CAMP 162.—KASHGAR.			
B	...	...	...
H.S. A	39 32 47	75 57 22	5120
Mt. Kungar (highest pk.)	38 39 26	75 24 4	23530
Mt. Chakkarakul, E. pk.	38 50 19	75 11 19	21480
,, W. pk.	38 51 49	75 8 54	22070

CO-ORDINATES OF PAMIR PEAKS.

Ref. No. on Pamir Chart.	Name of Peak.	Latitude N.			Longitude E.			Height.
		°	′	″	°	′	″	Feet.
1	Tagharma highest of 3 Sp. (identical with Muz Tagh Ata	38	16	42·5	75	9	32·8	24321* 24400†
2	Tagharma double sp. ...	38	14	0·0	75	9	12·5	22780
3	Pamir 5 h.....	37	33	56·19	75	12	14·72	20722
4	Pamir 6 h.....	37	28	12·4	75	9	39·4	18711
5	Taghdumbash h.	37	23	8·2	75	9	20·6	18060

* As corrected by Colonel Wahab in November, 1899.
† As determined by Captain Deasy.

1. The longitude of Camp 63 (Khotan) has been deduced from Camp 67. The values by A. and C. chronometers being 79° 58′ 32″ and 79° 58′ 2″ respectively, their mean has been adopted as longitude of Camp 63. The probable error in longitude, neglecting the probable error of the initial longitude, is 10″.

2. The longitude of Camp 37 (Kolkachi, Yarkand) from Camp 120, through Camps 124, 134, 26, 29, 47, and 35, was found to be 77° 19′ 24″; that directly from Camp 120 (using some selected rates) was found to be 77° 19′ 55″; but from Captain Trotter's station in Yangi Shahr it was found to be 77° 19′ 10″: the last has been adopted as the longitude of Camp 37. The probable error in longitude, neglecting the probable error of the initial longitude, is 2″.

3. The difference of height between the mark at edge of Yeshil Kul Lake and B end of Camp 109 (which is the former height of the lake) is 359 feet.

4. The difference between Camp 63 of 1896 and the old level of the lake is 367 feet.

HEIGHTS OF PASSES.

Camp from which Height was deduced.	Name of Pass.	Height.
		Feet.
1	Kilik	15850
7	Kunjuráb	14950
10	Ilisu, or Ilighsu	16750
13	Topa	10650
22	Kukalang	15500
26	Pyek	15800
26	Thing	13550
31	Sandal Dawan	16000
43	Arpa Talak	12400
43	Chiung Tung	13500
89	Atish	16500
92	Pass	15700
94	,,	17350
96	,,	17000
102	,,	16850
107	,,	17850
114	,,	16050
117	At-to	16600
120	Pichaniart	13600
123	Thong	14000
128	Sargon	11500
129	Sharnoz	13100
131	Shamátagal	12500
134	Adam Tuaymos	16050
135	Mamákul	16550
139	Yurghanak	15500
140	Furzanak	14800
140	Yatimkozik	15550
141	Kuramat	14400
144	Tarsi	13300
149	Kesin	12900
...	Khandar	16540

APPENDIX II

ZOOLOGICAL

[*From the* PROCEEDINGS OF THE ZOOLOGICAL SOCIETY OF LONDON, March 6th, 1900.]

On a small Collection of Mammals obtained by Captain Deasy in South Chinese Turkestan and Western Tibet. By G. E. H. BARRETT-HAMILTON, F.Z.S.

The small collection of mammals which is dealt with in the present paper includes only 16 specimens of 5 species, all rodents. These are, however, of considerable interest, since, apart from the localities in which they were procured, two of them, a Vole and a Jerboa, which I have named respectively *Microtus lama* and *Dipus deasyi*, belong to hitherto undescribed forms. A third is the extraordinary *Euchoreutes naso*, described by Mr. W. L. Sclater in 1890 from specimens obtained by the Hon. Charles Ellis somewhere in Eastern Turkestan. The acquisition of examples of this species (and genus) adds a valuable novelty to the collection of mammals in the British Museum, whither Capt. Deasy's specimens have found their way.

The following is a list of the specimens:—

MERIONES CRYPTORHINUS Blanford, J. A. S. Bengal, ii. p. 108 (1875).

No. 99.11.5.1. ♂. Kara Sai, Chinese Turkestan, 9th July, 1898, altitude 9,500 ft.

MICROTUS (ALTICOLA) LAMA, sp. nov.

a & *β*. No. 97.1.21.3 & 4. 25 miles south-east of Lake Arucho, W. Tibet, altitude 16,000 ft., August, 1897.

γ No. 99. 11.5.2, "Camp, 1898," Chinese Turkestan, altitude 16,500 ft., August 8th, 1898.

Native name, "Such Kun."

Type, no. 97.1.21.3.

Description. External characters similar to those of *M. stracheyi* Thos., but with the teeth and posterior termination of the palate very like those of *M. roylei* Ogilvie. Agrees with *M. albicauda* True in that $\overline{m.1}$ has 8 salient angles, but has the tail far shorter.

Dimensions of the type (in millim.):—*Dried skin.* Head and body 115; tail 12; hind foot with claws 19·5; hind foot without claws 8; ear 11.

Skull (damaged posteriorly)—zygomatic breadth 14·5; length of nasals 8·5; palatal length 14·5 (from posterior termination of palate to anterior margin of incisors).

The specimen *γ* appears to be the young of this form.

DIPUS DEASYI, sp. nov.

Type, No. 99.11.5.3. ♀, Nura, Chinese Turkestan, 7,500 ft., 6th October, 1818 (original number 73).

Description. In external appearance resembles *D. loftusi* Blanford, but the colour of the upper surface is richer and not so brown the exact tint being somewhere between "Ecru drab" and "Fawn colour"*.

Skull resembles that of *D. lagopus* Licht., but the teeth are more massive and their pattern less complicated.

Dimensions of the type—head and body 125; tail 160; hind foot 59; ear 18. (All taken from the dried skin.)

This is a very distinct Jerboa, with no very near known ally, and a detailed description of which would be unnecessary. I have pleasure in connecting it with the name of its discoverer.

* Ridgway, "Nomenclature of Colours," 1886, pl. iii.

DIPUS, sp. inc.

Nos. 99.11.5.4 & 5. 2 males, imm., Kotaz Langar, near Khotan, Turkestan, 4,700 ft., 8th October, 1898.

The immaturity of these two specimens prevents their satisfactory determination; they may be the young of *D. deasyi*.

EUCHOREUTES NASO, W. L. Sclater, P. Z. S. 1890, p. 610.

Nos. 93.11.5.6, 7 & 8. ♀. Ak Langar on the Yarkand-Khotan Road, altitude 4,500 ft., 3rd July, 1898.

Native name, "Sarok Kuruk" ("Brown Tail").

The original specimens of *Euchoreutes naso*, although known to be from Eastern or Chinese Turkestan, had no exact locality attached to them. It is satisfactory to have this deficiency supplied by Captain Deasy's specimens. The Ak Langar is a Rest-house. The specimens were obtained in the night, so that, although Captain Deasy states that the animal was very common, he is unable to give any details as to its habits.

OCHOTONA LADACENSIS, Günther, Ann. & Mag. Nat. Hist. ser. 4, xvi. p. 231 (1875).

No. 99.11.5.9. ♂. Yepal Ungur, Chinese Turkestan, 15,000 ft., 22nd July, 1898.

No. 99.11.5.10 & 11, two females. Ditto, ditto, 20th July, 1898.

No. 99.8.10.1. Zad Kulan Urgi, Chinese Turkestan, altitude 12,800 ft., 25th December, 1897.

No. 97.1.21.1. 25 miles S.E. of Lake Aru Cho, W. Tibet.

No. 97.1.21.2. Ditto, ditto.

LIBRARY OF THE BOMBAY BRANCH OF THE ROYAL ASIATIC SOCIETY

APPENDIX III

BOTANICAL

INTRODUCTORY NOTE ON BOTANICAL COLLECTIONS.

By Edmund G. Baker, F.L.S., British Museum.

The plants from Capt. Deasy's first expedition were received at Kew, in February, 1897, and were determined by members of the Herbarium Staff.

Among the more interesting of the plants collected on this expedition (the Botanical collecting on this journey being under the charge of Mr. Arnold Pike), may be mentioned *Ranunculus similis*, Hemsley (figured in Hooker's Icones, tab. 2586), a species closely related to *R. involucatus*, Maxim. and *Senecio* (*Cremanthodium*) *Deasyi*, Hemsley (Hooker, Icones, tab. 2587), gathered at Horpa Cho at a height of 17,500 feet.

On the second expedition, Capt. Deasy commenced collecting in Hunza in October, 1897, and continued to collect in Chinese Turkestan and Northern Tibet. The plants on this occasion were determined by members of the Staff of the Botanical Department of the Natural History Museum. Among the more interesting may be mentioned *Caragana frutescens*, D.C., var. *turfanensis*, Krasn, from foot of Ak Chalak Tagh, Kerian Mountains, previously collected by Przewalski at Chotan; a dwarf *Potentilla*, near Aksu, which I was at first inclined to consider as a new species, but is, perhaps, only an unnamed montane variety of the very polymorphic and widely spread *P. sericea*, Linn.; *Lactuca* (*Brachyrhampus*)

Deasyi, S. Moore,* from Aksu, a very remarkable species bearing an extraordinary likeness to a Crepis of the section Glomeratæ (Mr. Moore states the resemblance extends even to the partial union of the involucral leaves, and that its true affinity was not suspected until the achenes came under examination); *Polygonum Deasyi*, Rendle,* a member of Meisner's section Amblygonon from Northern Tibet; *Allium consanguineum*, Kunth, var. *roseum*, Rendle,* from Sarok Tuz Valley; *Festuca rubra*, L., var. *robusta*, Rendle,* from Shiran Maidan Hunza; *Festuca Deasyi*, Rendle,* allied to *F. sibirica* Hackel, from the Plateau near Polu.

It is impossible, in a brief summary, to refer to nearly all the points of botanical interest afforded by the collections. Take, for example, the first plant occurring in each list: *Clematis orientalis*, Linn., perhaps the most widely distributed of the known species of the genus. The type was figured by Dillenius in the Hortus Elthamensis, tab. 119, from a specimen brought from the East by Tournefort, thus showing the plant was known in this country in 1732. Many varieties have been described, as it is an extremely variable plant. Var. *acutifolia*, Hk. f. & T., is mentioned (in Henderson and Hume's "Lahore to Yarkand") as common in Yarkand and in the ravines above Sanju. Var. *tangutica*, Max. (Bot. Mag., tab. 7710) was collected by Capt. Deasy on his first expedition; and on the second expedition, at Chaka a plant was collected which is intermediate between sub-sp. *tibetica*, O. Kuntze and var. *tangutica*, Max. A very interesting find, of possibly far-reaching significance, is that of a plant which was collected at Aksai Chui, near Yepal Ungur, and was determined by Dr. Rendle to be *Zostera marina*, L. This maritime species occurs here at an altitude of 16,500 feet. In a certain number of cases, additional information is afforded by the collection in regard to our previous knowledge of the geographical range of the Central Asiatic species. The details can be seen in the subjoined lists, and as the Flora of Chinese Turkestan especially, is but poorly represented in our National Herbaria, collections from this region are of great value. The Flora of the country traversed by Capt. Deasy is not a rich one; in point of mere number of species it cannot in any way compare with that of the countries to the South, East, and West. We have in the South, India with a Flora which has been recently computed at 13,000 species; from the collections of the Abbé Delavay, Dr. Henry, and Mr. Thomas

* Descriptions of these plants will be found in the *Journal of Botany*, 1900, p. 428, &c.

Hancock we know the West of China also to be rich. The country to the west of Chinese Turkestan, Turkestan proper, has been carefully explored by the Russians—it has been found to be richer than Chinese Turkestan, but the Flora, which was begun by Regel, has only been completed as regards a small number of Natural Orders. Perhaps the most careful comparison of Central Asiatic Floras was that made by the late Dr. Maximowicz in a paper which appeared in the "Bulletin du Congrès international de botanique et d'horticulture à St. Petersbourg, 1884." The Mongolian Flora, which includes that of Chinese Turkestan, he then estimated at 1623 Phanerogams and Vascular Cryptogams, Compositæ, Leguminosæ, and Gramineæ being the most largely represented Natural Orders.

We cannot conclude without congratulating Capt. Deasy on the collections he has made in a country which is so little known botanically, and which furnishes an interesting link of connection between the Floras of the countries lying to the North, South, East, and West, which are comparatively well known.

CAPTAIN DEASY'S FIRST EXPEDITION TO TIBET, 1896.

Collected by Mr. Arnold Pike.

IDENTIFIED AT THE ROYAL GARDENS, KEW.

DICOTYLEDONS.

POLYPETALÆ.

No.	Name.	Place.	Altitude. Feet.
1	Clematis orientalis, *Linn.*, var. tangutica, *Maxim.*	Camp 41	14400
2	Ranunculus similis, *Hemsl.*	,, 13	16600
3	,, tricuspis, *Maxim.*	,, 23	17000
4	,, Cymbalariæ, *Pursh*	,, 10	16400
5	,, pulchellus, *C. A. Meyer* ...	,, 29	16200
6	,, lobatus, *Jacquem.*	,, 32	16800
7	,, involucratus, *Maxim.* ...	,, 10	16400
8	Corydalis Hendersoni, *Hemsl.*	,, 3	17100
9	Parrya lanuginosa, *Hook. f. & Thoms.* ...	,, 12	17000
10	Cheiranthus himalayensis, *Camb.* ...	,, 22	17300

No.	Name.	Place.	Altitude. Feet.
11	Alyssum canescens, *DC.*	Camp 26	16100
12	Draba alpina, *Linn.*	,, —	—
13	,, ,, ,, var. algida, *Regel* ...	,, —	—
14	Sisymbrium humile, *C. A. Meyer* ...	,, 25	16100
15	Eutrema ? Przewalskii, *Maxim.* ...	,, 10	16400
16	Christolea crassifolia, *Camb.*	,, 36	15200
17	Braya uniflora, *Hook. f. & Thoms.* ...	,, 6	17000
18	,, sinensis, *Hemsl.*	,, 10	16400
19	Capsella Thomsoni, *Hook. f.*	,, 23	17000
20	Dilophia salsa, *Thoms.*	,, 32	16800
21	Lychnis apetala, *Linn.*	,, —	—
22	Arenaria musciformis, *Wall.*	,, 6	17000
23	,, Stracheyi, *Edgew.*	,, 32	16800
24	Myricaria prostrata, *Hook. f.*	,, 30	16900
25	Thermopsis inflata, *Camb.*	,, 14	16200
26	Astragalus sp.	,, 6	17000
27	,, ,, ...	,, 3	17100
28	Oxytropis microphylla, *DC.*	,, 6	17000
29	,, ,, ,, var. elatior	,, 41	14400
30	,, sp.	,, 3	17100
31	Potentilla fruticosa, *Linn.*...	,, —	—
32	,, sericea, *Linn.*, var. polyschista, *Lehm.*	,, 6	17000
33	,, sericea, *Linn.*, var.	,, —	—
34	Chamærhodos sabulosa, *Bunge*	,, 24	16700
35	Saxifraga parva, *Hemsl.*	,, 32	16800
36	Sedum Rhodiola, *DC.*	,, 23	17000
37	,, tibeticum, *Hook. f. & Thoms.*, var. Stracheyi, *Clarke*	,, 3	17100
38	Selinum striatum, *Benth.*	,, 29	16200
	GAMOPETALÆ.		
39	Aster Bowerii, *Hemsl.*	,, 11	17000
40	,, tibeticus, *Hook. f.*	,, —	—
41	Leontopodium alpinum. *Cass.*	,, 11	17000
42	Tanacetum fruticulosum, *Ledeb.*... ...	,, 37	15000
43	,, tibeticum, *Hook. f. & Thoms.*	,, 15	16200
44	Artemisia Wellbyi, *Hemsl. & H. H. W. Pearson* (ined.)	,, 23	17000
45	,, salsoloides, *Willd.*	,, —	—
46	,, macrocephala, *Jacquem.* ...	,, 37	15000
47	Senecio goringensis, *Hemsl.*	,, 29	16200

No.	Name.	Place.		Altitude. Feet.
48	Senecio Deasyi, *Hemsl.*	Camp	12	17000
49	Saussurea bracteata, *Decne.*	,,	32	16800
50	,, subulata, *Clarke*	,,	7	16900
51	,, Kunthiana, *Clarke*	,,	—	—
52	,, glanduligera, *Sch.-Bip.* ...	,,	13	16600
53	,, sorocephala, *Hook. f. & Thoms.*	,,	12	17000
54	,, Thoroldi, *Hemsl.*	,,	—	—
55	,, Aster, *Hemsl.*	,,	10	16400
56	Crepis sorocephala, *Hemsl.*	,,	—	—
57	,, flexuosa, *Clarke*	,,	41	14400
		,,	26	16100
58	,, sp.	,,	6	17000
59	Taraxacum lanceolatum, *Poir.*	,,	30	16900
60	,, bicolor, *DC.*	,,	26	16100
61	Androsace Chamæjasme, *Host*, var. coronata, *Watt*	,,	15	16200
62	,, tapete, *Maxim.*	,,	10	16400
63	Gentiana Thomsoni, *Clarke*	,,	—	—
64	,, tenella, *Fries*	,,	32	16800
65	,, aquatica, *Linn.*	,,	32	16800
66	,, humilis, *Steven*....	,,	37	15000
67	Pleurogyne brachyanthera, *Clarke* ...	,,	30	16900
68	Microula tibetica, *Maxim.*	,,	23	17000
69	Scrophularia sp.	,,	—	—
70	Pedicularis longiflora, *Rudolph*	,,	37	15000
71	,, cheilanthifolia, *Schrenk* ...	,,	29	16200
72	Lagotis decumbens, *Rupr.*	,,	12	17000
73	Nepeta longibracteata, *Benth.*	,,	29	16200
74	Dracocephalum heterophyllum, *Benth.* ...	,,	15	16200
	APETALÆ.			
75	Salsola collina, *Pallas*	,,	—	—
76	Rheum spiciforme, *Royle*	,,	15	16200
77	Euphorbia tibetica, *Boiss.*	,,	—	—
78	Urtica hyperborea, *Jacquem.*	,,	—	—
79	Ephedra distachya, *Linn*	,,	27	16700
	MONOCOTYLEDONS.			
80	Allium senescens, *Linn.* var.	,,	—	—
81	Juncus Thomsoni, *Buchen.*	,,	26	16100
82	Kobresia schœnoides, *Boeck.*	,,	17	16300

No.	Name.	Place.	Altitude. Feet.
83	Kobresia Sargentiana, *Hemsl.*	Camp 17	—
84	Carex incurva, *Lightf.*	,, —	—
85	,, rigida, *Gooden.*	,, —	—
86	,, Moorcroftii, *Falconer ex Boott* ...	,, —	—
87	Pennisetum flaccidum, *Griseb.*	,, —	—
88	Stipa orientalis, *Trin.*	,, —	—
89	,, purpurea, *Griseb.*	,, —	—
90	Deyeuxia compacta, *Munro*	,, —	—
91	Diplachne Thoroldi, *Stapf*	,, —	—
92	Poa attenuata, *Trin.*	,, —	—
93	Atropis distans, *Griseb.* (forma nana) ...	,, —	—
94	Festuca valesiaca, *Schleich.*	,, 10	16400
95	Elymus sibiricus, *Linn.*	,, —	—
96	,, junceus, *Fisch.*	,, —	—

ENUMERATION OF PLANTS COLLECTED ON SECOND EXPEDITION, 1897-98-99.

DICOTYLEDONS.

POLYPETALÆ.

By Edmund G. Baker, F.L.S.

No.	Name.	Locality.	Altitude. Feet.
1	Clematis orientalis. L. var. between sub-sp. tibetica, O. Kuntze, and var. tangutica, Max. ...	Chaka	6700
2	Ranunculus Cymbalaria, Pursh ...	Karghalik ...	4500
	,, ,, ,, ...	Yepal Ungur ...	14850
3	Ranunculus pulchellus, C. A. Meyer	Aksu	15700
4	Delphinium sp.	near Kara Targaz	4300
5	Berberis integerrima, Bunge ...	Chaka	7000
6	Hypecoun leptocarpum, Hk. f. & Thoms.	Polu	8300
7	Cheiranthus himalayensis, Camb.?...	Camp 101 ...	16100
8	Alyssum canescens, DC.	Kizil Chup ...	15600
9	Sisymbrium humile, C. A. Meyer ...	Yepal Ungur ...	14850
10	Braya uniflora, Hk. f. & Thoms. ...	Sarok Tuz Valley	13500
11	Brassica Napus, Linn.	Boghaz Langar	5500
12	Malcolmia Africana, R. Br.... ...	Chaka	6700
13	Capsella Thomsoni, Hk. f.	Aksu	15700

No.	Name.	Locality.	Altitude. Feet.
14	Lepidium ruderale, Linn.	Polu	10300
15	Dilophia salsa Hk. f. & Thoms. ...	Sarok Tuz Valley	13500
	,, ,, ,, ...	Aksu	15700
	,, ,, ,, ...	Shor Kul ...	14800
16	Capparis spinosa, Linn.	Hunza Valley ...	9400
17	Silene conoidea, Linn.	Polu	8200
18	Lychnis apetala, Linn. ...	Shiran Maidan, Hunza ...	13000
	,, ,, ...	near Aksu ...	16000
19	Lepyrodiclis holosteoides, Linn. ...	Polu	8200
20	Arenaria musciformis, Wall... ...	Aksu	15700
21	Montia fontana, Linn. ...	Taghdumbash, Pamir ...	14000
22	Tamarix Pallasii, Des. f.	Khotan	4500
	,, ,, ,, ...	near Polu ...	8200
23	Myricaria prostrata, Hk. f. & Thoms.	Shor Kul ...	15000
24	Reaumuria Kashgarica, Rupr. var. Przewalskii, Max. ex descript.	Tolan Khoja Valley ...	11000
25	Reaumuria soongorica, Max. (Hololachne soongorica, Ehrenb.)	near Sorgak ...	7400
26	Nitraria Schoberi, Linn.	Kuyek	9700
	,, ,, ,, ...	Polu	8300
	,, ,, ,, ...	Kirian Mts. ...	8300
	,, ,, ,, ...	Yulgan Bulok ...	7600
27	Zygophyllum Fabago, Linn. ...	nr. Kara Targaz	4300
28	Zygophyllum Rosowii, Bunge ex descript.	near Sorgak ...	7400
29	Geranium collinum, Steph. forma ...	Camp 102 ...	16400
30	Medicago lupulina, Linn.	Polu	8300
31	Caragana sp.	Khotan ...	4500
32	Caragana frutescens, DC., var. turfanesis, Krasn.	At foot of Ak Chalah Tagh	8300
33	Sphærophysa salsula, DC.	near Polu ...	8200
	,, ,, ,, ...	Tugrok Langar	7000
	,, ,, ,, ...	Yulgan Bulok ...	7600
34	Astragalus alpinus, Linn.	Polu	8200
	,, ,, ,, ...	near Kara Sai ...	10500
35	Astragalus sp.	Plateau nr. Polu	10300
	,, ,, ...	Kara Sai ...	9500
36	,, ,, ...	Plateau nr. Polu	10300
37	Astragalus strictus, Graham ...	near Aksu ...	16500
38	Astragalus Thomsonianus, Benth....	Sarok Tuz Valley	13500
39	Astragalus tibetanus, Benth. ...	Yayek	9700

No.	Name.	Locality.	Altitude. Feet.
40	Oxytropis tatarica, Cambess. ...	Sarok Tuz Valley	13000
	,, ,, ,, ...	Kizil Chup ...	15600
41	Oxytropis chiliophylla, Royle forma	Sarok Tuz Valley	13500
42	Lathyrus sativus, Linn.	near Polu ...	8300
43	Indigofera sp.?	Tugrok Langar	7000
44	Prunus tomentosa, Thunb.	Khotan ...	4500
45	Prunus domestica, Linn. forma ...	Khotan ...	4500
46	Potentilla bifurca, Linn.	Polu	8200
	,, ,, ,, ...	Plateau nr. Polu	10300
	,, ,, ,, ...	Sarok Tuz Valley	13000
47	Potentilla sericea, Linn., var.	Shiran Maidan, Hunza ...	13000
	Potentilla sericea, Linn., var. (near var. polyschista, Lehm.)	Kuram Yepchum	1000
48	Potentilla sericea, Linn. var. Deasyi var. nov.*	near Aksu ...	16500
49	Rosa xanthina, Lindley	Chaka	7000
50	Chamærhodos sabulosa Bunge ...	Yepal Ungur ...	15000
51	Saxifraga Hirculus, Linn. ...	Shiran Maidan, Hunza ...	13000
52	Sedum quadrifidum, Pall.	Sarok Tuz Valley	13500

GAMOPETALÆ.

By Spencer Le M. Moore, B.Sc., F.L.S.

No.	Name.	Locality.	Altitude. Feet.
53	Aster heterochæta, Bth.	near Camp 94 ...	16000
54	Aster Boweri, Hemsl.	Camp 100 ...	15630
55	Calimeris altaica, Nees.	Camp 102 ...	16400
56	Erigeron uniflorum, Linn. var.	Aksu	15700
		Camp 100 ...	15600

* *Potentilla sericea*, Linn., var. *Deasyi*, Bak. fil.

Planta cæspitosa. Caules breves graciles erecti vel adscendentes. Folia radicalia pinnata, foliolis approximatis parvis summis majoribus reliquiis decrescentibus oblongis vel ovato-oblongis lobatis vel grosse serratis, folia caulinia digitatim 3–5 folialata.

Hab. Chinese Turkestan, near Aksu in the Kwen Lun Range. Alt. 16,500 ft. In flower July 26, 1898.

A dwarf plant, with radical leaves 2-3 cm. long. Leaflets small, subsessile, green above, white tomentose below; terminal leaflet 5-6 mm. long. Peduncles 1-flowered. Petals 5, yellow + 5 mm. long. Nearly allied to P. sericea, Linn. var. γ dasyphylla, Lehmann, Rev. Potentill, p. 34 (= P. dasyphylla, Bunge).

No.	Name.	Locality.	Altitude. Feet.
57	Leontopodium alpinum, Cass.	Valley of Talde Kol Su ...	13000
58	Leontopodium alpinum, Cass. (small mountain form) ...	Sarok Tuz Valley	13500
59	Pulicaria salviæfolia, Bge.	Atabad	7600
60	Artemisia vulgaris, Linn. var. ...	near Kilik Pass	13000
61	Artemisia minor, Jacq.	Kizil Chup ...	15600
62	Artemisia sp.? (very young) ...	Tolan Khoja ...	8100
63	Artemisia desertorum, Spreng. ...	Kizil Chup ...	15600
64	Tanacetum tibeticum, Hook. f. & Thoms.	Sarok Tuz Valley	13000
65	Saussurea glanduligera, Schz. Bip.	Kizil Chup ...	15600
66	Saussurea subulata, Clarke	At Tui, Sarok Valley ...	16200
		near Camp 94 ...	16000
67	Saussurea Aster, Hemsl? (specimen very young) ...	Camp 110, near Yeshil Kul ...	16800
68	Saussurea Thoroldi, Hemsl. ...	Aksu	15700
69	Saussurea Thomsoni, Clarke	At Tui, Sarok Valley ...	16200
70	Saussurea Kunthiana, Clarke ...	Sarok Tuz Valley	13500
71	Saussurea bracteata, Dne.	Aksu	15700
72	Barkhausia flexuosa, DC. ...	Atabad Hunza Valley ...	7600
73	Barkhausia flexuosa, DC. var. (small form)	near Camp 94 ...	16000
74	Taraxacum officinale, Wigg. ...	Hills nr Kara Sai	10500
75	Taraxacum officinale, Wigg. var. ...	near Camp 94 ...	16000
76	Taraxacum bicolor, DC.	Shor Kul ...	14800
77	Launæa sp.? (specimen imperfect)	Polu	8300
78	Chondrilla sp.? (specimen without flowers)	Takla Makan, nr. Kara Targaz	4300
79	Mulgedium tataricum, DC. ...	Boghaz Langar	5500
80	Lactuca Deasyi, S. Moore	Aksu	15700
81	Scorzonera sp. (specimen very young)	near Polu ...	10300
82	Androsace Chamæjasme, Host	Sarok Tuz Valley	13000–13500
83	Androsace tapete, Maxim. ...	Hills near Kara Sai ... about	10500
		Sarok Tuz Valley between Camps 86 & 87	12000
84	Androsace microphylla, Hook. f. ...	near Camp 94 ...	16000
85	Glaux maritima, Linn.	Khotan	4500

No.	Name.	Locality.	Altitude. Feet.
86	Statice aurea, Linn.	near Polu ...	8300
		near Sorgak ...	7400
87	Cynanchum acutum, Linn.	near Gircha, Hunza Valley	8900
88	Gentiana aquatica, Linn.	near Camp 94	16000
89	Pleurogyne carinthiaca, Griseb. ...	Aksu	15700
90	Pleurogyne diffusa, Maxim. ...	Aksu	15700
91	Swertia petiolata, Royle, var. ...	Hunza Valley ...	13000
92	Microula tibetica, Maxim. ...	Aksu	15700
		Camp 100 ...	15600
		Camp 102 ...	16400
93	Convolvulus arvensis, Linn.	Polu	8300
		near Polu ...	8300
94	Lycium turcomanicum, Fisch. & Mey.	Yulgan Bulok ...	7600
		Tolan Khoja ...	8100
95	Dodartia orientalis, Linn. ...	Outskirts of Khotan ...	4500
96	Pedicularis alashanica, Maxim.	Sandy plateau W. of Polu ...	10300
97	Pedicularis abrotanifolia, MB. ...	Aksu	15700
98	Pedicularis Œderi, Vahl	near Camp 94 ...	16000
99	Pedicularis sp.? (specimen too young to determine) ...	Plateau near Polu	10300
100	Phelypæa calotropoides, Walp. ...	near Mudji ...	4400
101	Lagotis decumbens, Rupr.	Aksu	15700
102	Dracocephalum heterophyllum, Bth.	Sarok Tuz Valley	13000
103	Plantago tibetica Hook. f. & Thoms.	Polu	8300
104	Plantago ovata, Forsk.	Polu	8300

APETALÆ.

By A. B. RENDLE, M.A., D.Sc.

No.	Name.	Locality.	Altitude. Feet.
105	Chenopodium album, Linn.	Kara Sai ...	9500
		Polu	8300
106	Eurotia ceratoides, C. A. Mey.	Northern Tibet, Shor Kul ...	15000
107	Corispermum hyssopifolium, Linn.	Atabad Hunza Valley ...	7600
		Polu	8300

(Very common in sand in bed of Hunza Valley.)

No.	Name.	Locality.	Altitude. Feet.
108	Halogeton glomeratus, C. A. Mey.	Atabad Hunza Valley ...	7600
109	Polygonum aviculare, Linn.	Northern Tibet, Camp 101 ...	16100
110	Polygonum sibiricum, Laxm.	Yepal Ungur, Kiria River ...	16200
111	Polygonum Deasyi, Rendle, sp. nov.	Northern Tibet, Camp 103 ...	15600
112	Polygonum, sp. without flowers ...	Chaka	6700
	(Thin ropes are said to be made from this plant.)		
113	Calligonum polygonoides, Linn.	In sandy waterless desert, Nura	6800
	(Native name "Chekundo" (Chakandar). An interesting north-easterly extension of the distribution of this species known hitherto from Egypt, Syria, Persia, Punjab and Scinde.)		
114	Elæagnus angustifolia, Linn. var. orientalis, Schlect.	Khotan ...	4500
	(Native name "Jigdachichik." Common throughout Chinese Turkestan).		
115	Euphorbia tibetica, Boiss.	Sarok Tuz Valley	13000

MONOCOTYLEDONS.

By A. B. RENDLE, M.A., D.Sc.

No.	Name.	Locality.	Altitude. Feet.
116	Asparagus verticillatus, Linn. ...	Polu	8300
	(Native name "Ojun.")		
117	Allium oreoprasum, Schrenk	Plateau near Polu	10300
	(Native name "Atçhku Yowa.")		
118	Allium consanguineum, Kunth, var. roseum, Rendle, var. nov.	Sarok Tuz Valley	13000
	(Indistinguishable from the species except by its rose-coloured flowers; those of the species are described as golden-yellow).		
119	Juncus membranaceus, Royle ...	Aksu	15800
120	Triglochin palustre, Linn. ...	Northern Tibet, near Camp 94	16000
121	Zostera marina, Linn. ... (A very interesting find.)	Aksai Chui near Yepal Ungur	14850
122	Carex Moorkroftii, Falc.	Shor Kul, Northern Tibet	15000
123	Stipa purpurea, Griseb.	Northern Tibet, Camp 100 ...	15700

No.	Name.	Locality.	Altitude. Feet.
124	Stipa splendens, Trin. (= Stipa altaica, Trin.)	Kara Sai ...	9500
125	Stipa sp. (Insufficient for specific determination)	Kara Sai ...	9500
126	Chloris barbata, Swartz	Boghaz Langar	5500
127	Poa alpina, Linn.	Sarok Tuz Valley	13500
128	Poa attenuata, Trin. ... ... (Native name, "Ak Ote")	Plateau near Polu	10300
129	Festuca ovina, Linn. var. valesiaca, Koch	Taghdumbash Pamir ...	14000
130	Festuca rubra, Linn. var. robusta, Rendle, var. nov.	Shiran Maidan Hunza Valley, near Kilik Pass	13000
131	Festuca Deasyi, Rendle, sp. nov. (Native name "Kileb")	Plateau near Polu	10300
132	Hordeum violaceum, Boiss. ...	Kara Sai ...	9500
133	Agropyrum Thoroldianum, Oliver	Northern Tibet, Camp 100 ... and Camp 102 ...	15630 16400
134	Elymus sibiricus, Linn.	Kara Sai ...	9500
135	Elymus dasystachys, Trin. ...	Kara Sai ... Valley of Talde Kol Su ...	9500 13000

There are also a few grasses represented by leaves only, which it is impossible to determine.

GLOSSARY

Beg, Important native official
Caravan Bashi, Head of a Caravan
Chang Tang, Native name for Tibet
Chow Kuan, District Magistrate
Cho, Lake
Dawan, Pass
Ghi or Ghee, Butter, (often rancid)
Kara, Black
Kyang, Wild Donkey
Kuk Bashi, Head of Canals
Kul, Lake
La, Pass
Marpa, Small one-horse Chinese cart
Ming Bashi, Head of 1,000
Oan Bashi, Head of 10
Sai, Water
Sheetai, Chief military officer, corresponding to General Officer Commanding
Sin Chiang, Chinese name for Chinese Turkestan
Suttoo, parched barley, ground, (in which there is often plenty of dirt)
Su, Water
Taotai, Chief civil officer
Teetai, Chief military officer
Yak dan, Indian-made leather-covered box for camels, ponies, bullocks or mules
Yangi Shahr, Chinese town
Yuz Bashi, head of 100

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